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# PAPERS

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ON

# NAVAL OPERATIONS

DURING

THE YEAR ENDING JULY, 1885.

NAVY DEPARTMENT,
BUREAU OF NAVIGATION,
OFFICE OF NAVAL INTELLIGENCE,
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# INTRODUCTORY NOTE.

The following papers, made up in great part from the reports of officers, descriptive of the more important naval operations of the past year, are published for the information of naval officers.

The action at the Pagoda Anchorage, in the Min River, furnishes the only example of a fleet engagement since the battle of Lissa, and while it throws no additional light upon the interesting and vexed problem oj Tactics it illustrates the effect of gun and torpedo, and draws attention to the preparations for action on board vessels in the French fleet.

The successful attack on two occasions by torpedo boats armed with spar torpedoes make it clear that our only service torpedo is not to be wholly condemned, even in comparison with the Whitehead whose field of usefulness is much more extended.

The operations of the United States Naval Brigade on the Isthmus of Panama, aside from the public interest in the results accomplished, and the landing of a brigade of 660 officers and men from the North Atlantic squadron on Gardiner's Island for instruction, should direct attention to the absolute necessity of a complete and uniform organization for landing parties and brigades, so that each vessel of a squadron, or any assemblage of vessels from different stations, may be prepared at an hour's notice, or upon the display of signal, to land its contingent, properly equipped and instructed, to take promptly, and without special directions, its place in the battalion or brigade formation.

The value of instruction, such as was given on the occasion of the landing at Gardiner's Island, cannot be overestimated.

The notes in Chaper IV present facts in reference to the design or performance of vessels recently laid down, launched, or completed, and a description of the latest improvements in other implements of naval warfare.

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# FRENCH NAVAL OPERATIONS

IN THE

# MIN RIVER, CHINA,

AUGUST, 1884.

## PREFATORY NOTE.

To understand the reasons for the bombardment of the arsenal of Foo-Chow, it is necessary to go far back in history. Before the Christian era China conquered Tonquin and Anam, but in the fifteenth century the Anamites obtained their independence, although the Chinese have always claimed sovereignty since. In the seventeenth century the French Jesuits went to Cochin-China, or Anam, to proselytize, and were followed by traders and politicians, until toward the end of the eighteenth century France obtained a small territory in Tonquin, a province of Anam, in sovereignty. This has since grown steadily. As a result of a war between the French and the Anamites, a treaty was made in 1874 recognizing the protectorate of France over Anam, and the latter's independence of China. In 1880 the Emperor of Anam claimed Chinese assistance to put down a rebellion, thus acknowledging Chinese sovereignty. In July, 1881, the French ministry asked a credit to maintain order in Tonquin, and in 1882 Captain Rivière was assigned to the command of an expedition to punish the rebels. The mandarins, however, were so unfriendly that Rivière found himself obliged to attack them and capture the town of Hanoi. This act was disavowed by the French authorities, and a period of inaction followed, during which the number of Chinese in the country greatly increased, and France found herself really opposed to the Chinese Government. In May, 1882, a reconnaissance of the French was defeated and Rivière killed. Troops were sent from France and placed under the command of Admiral Courbet, who was also in command of the naval forces. After some successful operations on the part of the French, Anam submitted and a treaty was made. This treaty left France and China opposed as to the protectorate of Anam, China being unwilling to yield her claims. China had not withdrawn her troops from Tonquin, and announced that a French occupation of certain towns garrisoned by Chinese would be cause of war. The French did occupy these towns, but the convention of Tien-Tsin settled matters peaceably. The convention secured France in her advantages and stipulated for the withdrawal of the Chinese troops, while France renounced her claims to an indemnity. When the French expeditionary troops were ready to return home, a small French column was sent forward to occupy Langson, which should have been evacuated by the Chinese. The Chinese had not yet withdrawn and a fight followed, upon which France demanded a large indemnity. This was finally refused, and France began a course of reprisals without declaring war formally. This brought about the bombardment of Foo-Chow.

## EXTRACTS FROM REPORT OF REAR-ADMIRAL DAVIS.

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At the time of my last communication of the 18th instant, the French and Chinese squadrons were still at Pagoda anchorage, awaiting the result of pending negotiations. On the 20th the news arrived that the French chargé d'affaires at Peking had given the Chinese Government forty-eight hours to promise to pay the sum of 80,000,000 francs indemnity, otherwise he would haul down his flag and negotiations would be stopped. It was further reported that the Chinese had emphatically declared they would not pay.

Vice-Admiral Dowell and I had agreed to send up more men to Foo-Chow in the event of an engagement at Pagoda anchorage, and Commander Barker, of the Enterprise, had instructions to send his at the same time that the British went up. On the morning of the 22d Vice-Admiral Dowell asked Vice-Admiral Courbet's opinion as to the advisability of sending them that morning, and was advised not to lose that morning's flood-tide. Vice-Admiral Courbet further stated that he had not as yet received any instructions to commence hostilities, but that one of his gunboats, the Lynx, was at the termination of the wire at the mouth of the river, and might arrive at any moment. At 1 p. m. our men from the Enterprise and the British from the Champion, Sapphire, and Vigilant arrived here. The British landing force was thereby increased to 200 officers and men and 2 howitzers and 1 Gatling. The Enterprise sent a force of 90 men, 7 officers, and 1 Gatling, increasing our landing party to a force of 165 officers and men and 2 Gatling guns. All our men were comfortably quartered on board the Monocacy, and immediately upon arrival organized. The 34 marines were divided into two detachments, and the blue-jackets into three companies of infantry and two Gatling-gun crews, also a party of 8 pioneers, and an ambulance party of 4.

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On the morning of the 23d the French consul here notified all his colleagues that France not having received reparation for the breach of the Tien-Tsin treaty on the part of the Chinese at Langson, Vice-Admiral Courbet had received instructions to commence hostilities in the Min River, and that he (the consul) had hauled down his flag. I subsequently learned that Vice-Admiral Courbet had sent a similar letter to Vice-Admiral Dowell and Commander Barker, notifying them that he would commence hostilities that day, and requesting them to notify any neutrals that might be on shore.

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*The Vice-Admiral commanding-in-chief the Naval Divisions of Tonkin and the China seas to the captain of the American Corvette Enterprise.*

VOLTA, PAGODA ANCHORAGE,
*August* 22, 1884.

SIR: In the absence of Admiral Davis and of any American consul at Pagoda, I have the honor to inform you that the French Government, having been unable to obtain from China the reparation which it demanded on account of the affair of Langson, has ordered me to retaliate in the Min River. I shall be indebted to you if you will warn the American merchantmen in harbor and also the American residents at Pagoda.

Receive, sir, the assurance of my most distinguished consideration.

A. COURBET.

# REPORT OF LIEUT. H. MORRELL ON THE PREPARATIONS MADE BY NAVAL BRIGADE OF U. S. S. MONOCACY AND ENTERPRISE FOR DEFENSE OF AMERICAN LIFE AND PROPERTY AT FOO-CHOW, AUGUST, 1884.

I have the honor to make the following report in regard to the preparations made for the protection of American, English, and other neutral property at Foo-Chow. A plan of the settlement of Nantai is appended.

The Monocacy arrived off Nantai on the 3d of August, and took her position, as indicated in the plan, abreast the custom-house and about 80 yards from the Bund. The English gunboat Merlin, 430 tons, with a crew of 70 men, under the command of Lieutenant-Commander Brenton, R. N., had arrived on the 23d of July and was moored off Jardine, Matheson & Co.'s, about 75 yards E. by N. of this vessel. There were also 80 men from H. B. M. S. Champion, with 1 7-pounder field-piece and 1 long Gatling gun, quartered on 2 cargo-boats anchored near the Merlin. Several house-boats were used for the accommodation of the officers in charge of this detachment.

Preparations were at once made for landing. An officer was stationed at the United States consulate with an outfit for day and night signals and a special code of signals was prepared to facilitate communication. Officers were directed to acquaint themselves with the settlements, particularly with the routes to be used and places to be protected.

As in the event of an outbreak it was imperative that the detachments should reach the different points assigned with the least possible delay, and as the streets were narrow and crooked, and provided with barricades liable to be closed at any moment, it was deemed necessary to transfer to the shore whatever might retard the movement of the men. Accordingly the Gatling gun was dismounted and carried in pieces to the consulate, and the 4 signal-men detailed to remain at the consulate took charge of it. The reserve and Gatling gun ammunition was distributed as follows: At Hedge & Co.'s, 1,000 rounds; at Russell & Co.'s, 1,000 rounds; at consulate, 3,080 for Gatling gun and 1,000 for rifles; at American Missionary Compound, 1,000 rounds. These preparations were made as quietly as possible to avoid alarming the natives, who had been very restless since the arrival of the French at Pagoda anchorage on the 14th of July. Twenty rounds of ammunition were issued to each man. Eight of the Gatling gun's crew were armed with rifles, provided with slings made of canvas; the remainder with revolvers and cutlasses.

The Blue-jackets were not supplied with knapsacks and canteens. The want of these in actual service would undoubtedly be felt, especially the latter as water in this country cannot be used without endangering health. The cartridge-boxes furnished were not efficient; the leather, after a little service, loses its stiffness, and the cover bends up and the box down, leaving a space large enough for cartridges to pass through. In my opinion, this cartridge-box should be changed for another of a better and more reliable pattern.

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On the 22d, Admiral Courbet having announced his intention of commencing hostilities the following day, the English and American reenforcements proceeded to Foo-Chow.

The Enterprise's landing party numbered 84 men, organized as follows: Lieut. Commander G. M. Book, commanding; Surgeon H. N. Beaumont; first company, 23 men, Lieut. H. Osterhaus, Ensign Rohrbacker; second company, 23 men, Lieutenant Hodges; Gatling gun's crew, 16 men, Ensign C. N. Atwater; marines, 18 men, Ensign C. A. Gove; pioneers, 4; nurse, 1; stretcher-bearers, 2. This body was supplied with 18,000 rounds of ammunition. The men were provided with blankets, but not with knapsacks or canteens. The accommodations for this extra force were ample, and had hammocks been provided the men would have been as comfortable as on their own ship.

The Monocacy's battalion was now reorganized as follows: Lieut. F. W. Nichols, commanding; Passed Asst. Surg. E. Norfleet; first company, 30 men, Lieut. H. Morrell, Ensign H. Kimmell; Gatling gun's crew, 16 men, Ensign J. H. L. Holcombe; marines, 16 men, Lieut. M. L. Wood; pioneers, 4; nurse, 1; stretcher-bearers, 2.

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In case of landing, the Enterprise's first company was to occupy Russell & Co.'s and Hedge & Co.'s, with Lieut. H. Osterhaus at the former place and Ensign Rohrbacker at the latter. The remainder of the force was to land at the custom's steps, abreast the ship, and, with Monocacy's battalion leading, was to advance by the route marked —-—-—-— on the plan, Plate I, to the consulate. One company was then to be detached and sent to the Missionary Compound. The marines and Gatling guns were to defend the consulate, the rest forming a reserve to be sent wherever required.

The English landing force consisted of 190 men, and were stationed as follows: 30 blue-jackets at Jardine, Mathison & Co.'s, 30 at Bathgate & Co.'s hong near bridge; and at the English consulate, 60 marines, 20 blue-jackets, one 7-pounder, one Gatling gun, and one Gardner, with their crews, 50 men, 36 of whom were armed with rifles.

Between Foo-Chow and the mouth of the Min, according to the Chinese, 60,000 men were stationed in the different forts and camps; 30,000 of these were raised in Kwangtung (Swatow and Canton), Hunan, and Hupeh, the remainder belonging to this province, Fukien. These formed as many factions as there were provinces represented, and entertained the most bitter feelings toward one another. They were, as a general thing, well armed and poorly disciplined, and to their friends a source of greater danger than to the enemy. Before the French commenced operations it was considered quite probable that, in the event of a bombardment of the forts and camps, the soldiers on the right bank of the river would make their way in a disorganized and disorderly condition through the settlement of Nantai, across the bridge to Foo-Chow, and, after the fashion of Chinese braves, loot and commit other outrages on the way. That this was expected by the people was evidenced by nearly one-half of them fleeing to the mountains.

It was therefore necessary to make preparations to prevent the rush of a mob across the bridge from Foo-Chow and to check any riot or disorder caused by troops during a retreat. Ample provision was made to meet the first emergency, the bridge to the southward of Chung-Chow being commanded by a cross-fire from Bathgate & Co.'s hong near bridge and the British consulate, and if necessary by an enfilading fire from the hill about 50 feet east of the Club, while the Monocacy and Merlin controlled the bridge to the northward of the island. The second, however, was more difficult to contend with. An orderly retreat could not be opposed, and whether it would be disorderly or not could not be determined until the fugitives were actually in the settlement.

The dispositions before mentioned seemed the best that could have been made with the force at hand, in order to exert the best influence on a rabble.

The preventive measures taken and heretofore described having had the desired effect of preventing any outbreak on the part of the mob, it resulted in there being no occasion to land men. By the 4th of September there being no appearance of disorder and affairs having settled to their normal condition, Vice-Admiral Dowell and Rear-Admiral Davis considered the further display of additional force unnecessary, and the re-enforcements were ordered to rejoin their ships.

## *REPORT OF VICE-ADMIRAL COURBET, COMMANDER-IN-CHIEF OF THE SQUADRON OF THE EXTREME EAST, TO THE MINISTER OF MARINE AND THE COLONIES.*

MATSU, *September* 11, 1884.

SIR: I have the honor to forward you an account of the operations carried out in the Min River by a part of the forces under my command.

On the 22d, about 5 p. m., the order to open fire was received by telegraph.

The following ships were off the Pagoda: The Volta (flying my flag), the Duguay-Trouin, Villars, D'Estaing, Lynx, Vipère, Aspic, and Nos. 45 and 46, torpedo boats. The Chinese had assembled eleven men-of-war; that is, one cruiser, five transports, a dispatch boat, a dispatch gun-vessel, and three gunboats. Besides they had twelve large war-junks, seven steam torpedo launches, three or four pulling torpedo boats, and some fire-junks.

The Chateau-Renaud and the Saône were anchored at Quantao, at the Kimpai Pass, with orders to prevent the obstruction of this channel, either by the sinking of some thirty stone-laden junks which had been collected there, or by the sowing of torpedoes.

There were also at the Pagoda anchorage, but further down, three English men-of-war, the Vigilant (flag-ship of Admiral Dowell), the Champion and Sapphire, the American corvette Enterprise, and some merchant steamers and sailing ships.

The French vice-consul at Foo-Chow, whom I had asked to come on board the Volta in good time, was immediately informed of the Government's decision, and went up to Foo-Chow to haul down his flag and warn the viceroy and the other consuls that fire would be opened the following morning. On my part I informed the English admiral that evening, and the captain of the Enterprise early the next morning, and asked the English vice-consul at Pagoda to warn the merchant ships. The greater part of these had, like the men-of-war, already anchored outside the probable line of fire.

On the morning of the 23d M. Bezaure returned, informing me that his flag had been hauled down; that at 8 a. m. the consuls, and at 10 a. m. the viceroy, would all have been warned of my intentions. This was a mere formality, because on the 22d everyone knew that I would open fire the next day.

All preliminaries being arranged, it remained only to select a favorable moment for destroying the ships and war-junks, and the flanking torpedo boats, before attempting anything else. The first of the ebb was thought the best time for accomplishing this first object in view of the respective positions of the squadrons, and of having to maneuver in a narrow channel where the strong currents made movements difficult. As the ebb began several hours after the viceroy and consuls were officially warned, I set 2 o'clock as the time for beginning operations.

From early morning the vessels on both sides had their fires lit and were ready to slip and get under way. While the flood was making, from 9.30 to 1.30, the Chinese were clearing for action and getting ready to weigh, and several of their torpedo boats ran down to the Volta, making false attacks, but retired upon pointing a gun or Hotchkiss at them. At 1.45 I made signal to weigh and to be ready to carry out the plan of attack. My plan was as follows:

Upon beginning the action the torpedo boats Nos. 45 and 46 were to attack the Foo-Poo and Yung-Woo, being supported by the port battery and riflemen of the Volta; this vessel was to open fire with the starboard battery upon the war-junks who chiefly threatened her. At the same time the three gunboats, Aspic, Vipère, and Lynx, leaving the Volta, the torpedo boats, the Foo-Poo, and Yung-Woo on the starboard side, were to run up quickly abreast the arsenal and attack the three gunboats and three transports lying there. Four steam launches under Lieutenant Lapeyrère were to protect the Volta, Aspic, Vipère, and Lynx against the Chinese torpedo launches.

The Duguay-Trouin, Villars, and D'Estaing were to attack, with one battery, the three ships near them, while raking the junks and a battery of three Krupp guns which commanded the arsenal with the other. Their armed steam launches were to defend them from the enemy's torpedo boats. As soon as the three vessels ceased firing the D'Estaing was to go to the mouth of the little channel by the custom-house to sink some junks which were said to be armed for boarding.

The plan was carried out in every particular. All the ships opened fire as the torpedo boats attacked; the Chinese replied immediately. The air was almost calm, and for a few minutes a cloud of smoke surrounded the combatants and a shower of projectiles whistled about them. As soon as the smoke lifted we saw the Yung-Woo ashore, having been destroyed by No. 46, Lieutenant Douzans commanding, and several sinking war-junks; the Foo-Poo, struck by No. 45, Lieutenant Latour commanding, but less seriously hurt, was still resisting. The other ships seemed already greatly damaged.

The Fei Yuen, Chi-an, and Chuen-Wei, dismasted and on fire by the shells of the Duguay-Trouin, Villars, and D'Estaing, were drifting with the tide; they grounded, and then sank some miles down the river. A little later the same end befell the two alphabetical gunboats.

After the first set-to the fire sensibly slackened, and our well-pointed guns soon destroyed the Chinese fleet.

Owing to the light draught of the Yung-Pao and Yei-Sing, these boats ran up the river where our gunboats could not follow them. Their injuries, however, were such that both of them grounded and afterward sank. This was the end of the Chinese squadron.

Our gunboats now gave their attention, first to the ships lying at the arsenal and then to the arsenal itself, while the other ships silenced the batteries at the arsenal and at the Pagoda on the island of Losing.

The Triomphante arrived a little after 2 and anchored below Pagoda, opening fire upon points within range, but principally upon the Pagoda batteries. By a shell from thence two men of the Volta were killed, and my flag-lieutenant, M. Ravel, and three men were wounded.

The torpedo boats which had armed the day preceding and on the morning of the action had been threatening us disappeared just before its commencement and sought refuge, some up the river and others in the channel of the custom-house. Lieutenant Lapeyrère tried in vain to reach them, and then turned his boats upon the Foo-Poo, which would probably have succeeded in getting up the river. He took her by boarding, and ran her aground below the anchorage, where she sank.

Late in the afternoon our armed boats dislodged the torpedo boats sheltered in the little custom-house channel, and at the same time they destroyed the junks and sampans which seemed to be prepared as fire-ships.

Foreseeing that the Chinese would attempt to surprise us during the night with their remaining fire-ships, I caused my ships to anchor at such a distance as to allow them time to weigh and save themselves.

These precautions were also necessary, as the burning hulks of the destroyed ships ascended with the flood and drifted out again with the ebb. There was also reason to expect torpedo boats, and they did appear. The night of the 23d–24th was one of constant alarms; most of the vessels had to weigh three or four times. Nevertheless, the attempts of the Chinese resulted unfavorably for them. About 9 p. m., at the end of the ebb, the Chuen-Hung, fired by our shell, was shoved toward our anchorage by two large junks, manned by some thirty men. A few shot from the D'Estaing, our picket ship, sank the junks with their crews, but the transport continued to drift with the current, threatening in succession several vessels.

On the 24th my first object was to finish the destruction of the junks and of the burning fire-ships which lay in the custom-house bay and above the arsenal. Two divisions of boats were sent for this purpose, one in charge of M. Peyrounet and the other of M. Lapeyrère.

I weighed with the Volta and the three gunboats to support the second division, and also to complete the destruction of the arsenal.

By the afternoon our 28-kilogram shells had destroyed all that they were equal to attempting. The direct fire upon the offices, shops, and a cruiser building did much damage, but not all that I wished. With guns of 14 centimeters it was impossible to do more.

The foundry, designing office, and office of precision were considerably injured. The hull of the cruiser was peppered with holes, but this caliber (14 centimeters) was not large enough. I should have had 24 centimeters, or at least 19 centimeters; in other words, I needed the Triomphante or the Duguay-Trouin, but the pilots declared it impossible to bring them within range even for an hour before and after high water, and soundings made by M. Renaud with this object in view confirmed their statement.

On the morning of the 25th I confined myself to taking by assault, with the landing parties of the Duguay-Trouin and Triomphante, the battery of three Krupp guns at Pagoda. Its garrison abandoned it upon the approach of our people, but we soon saw a great number of troops descending from the neighboring heights. The fire from our boats and some 14-centimeter shell kept them beyond the sandspit which at half-tide joins the island of Losing to the mainland. At 10 a. m. the boats and landing parties returned, bringing the three guns.

Nothing more could be done at Pagoda with the means at our disposal. I left the Volta and hoisted my flag on the Duguay-Trouin. After the men's dinner all the squadron weighed in order to destroy the forts on the river.

At 1.30 we anchored above Cuding Island and cut the telegraph line which connects all the forts with the arsenal and with each other. The next step was to destroy a casemate battery armed with an Armstrong 21½-centimeter gun (No. 12 fort), which commands the Mingan Pass. Only the guns of the Duguay-Trouin and Triomphante were heavy enough to be effective, but in less than an hour the fort, being taken in rear, was much damaged, and the guns on Cuding Island were silenced. A few well-pointed 14-centimeter shell convinced me they were abandoned.

The landing parties of the Villars and D'Estaing, under M. Sango, were sent ashore to support some torpedo men who were ordered to destroy the Armstrong gun with gun-cotton. Strong eddies in the river and the insufficiency of our steam launches made it difficult to put these parties ashore, but the Chinese did not think of disturbing them, and at nightfall they all returned.

The next day, the 26th, the other batteries of the Mingan Pass were attacked. The Duguay-Trouin and Triomphante, although giving most of their attention to the five casemated batteries, delivered several very effective broadsides against the other works. The Mingan battery made some resistance, but the shells of the Villars and D'Estaing soon disabled it, after which a party of torpedo men, supported by a landing party under M. Le Pontois, destroyed the guns.

The work was scarcely finished when a brisk musketry fire broke out from the neighboring heights where is the house of the Tao-Tai-Fan, in charge of the river defenses. Our boats promptly replied, and were aided by some 14-centimeter shells and a few rounds from the Hotchkiss guns of the Villars and D'Estaing, which dispersed the enemy.

At the same time the Volta and the three gunboats which had anchored near the Cuding forts supported another party of torpedo men and landing party under Lieutenant Fontaine, who was ordered to destroy the magazines and guns of this fort. As on the day before, the party was not disturbed.

The Duguay-Trouin and Triomphante destroyed the other batteries, noticeably one of the casemated ones on the right bank, protected by fifteen thicknesses of 2-centimeter plates solidly fastened together (No. 10 fort). The garrisons of these forts abandoned them and fled to the neighboring mountains, whence those who showed themselves were dislodged by our small arms and Hotchkiss guns.

Before night our torpedo men had destroyed the six guns in casemates on the left bank and two of those on the right bank. The next morning the rest were destroyed, but that required some hours, so that we could not weigh before the tide turned flood, or about 1 p. m.

About 2.30 all the ships had joined the Chateau-Renaud and the Saône, above the Kimpai Pass, where they had been on the lookout. This was easy enough in the daytime, but offered considerable difficulty at night.

They had to leave their anchorage off Quantao and send out picket boats, making great use of the electric search light, but they were successful. The stone-laden junks were collected under the right bank and the raft for completing the obstructions was grounded on the other side.

Captain Boulineau made all the preparations for destroying the junks, and his boats, supported by the Vipere and Aspic, undertook the operation. The intrenched camp at Kimpai opened a sharp musketry fire, but did not succeed in preventing the destruction of the junks, which were all sunk or burnt by 6 o'clock. Lieutenant Bouet-Villaumez was killed here and Sub-Lieutenant Charlier and several men of the Vipère were wounded.

At the same time the cruisers bombarded the camps in sight, and the Duguay-Trouin and Triomphante ran down below the Middle Ground to reconnoiter the defensive works and begin the attack. Upon their approach two batteries of 14-centimeter guns, recently erected to rake the channel, opened fire. In less than half an hour these batteries were silent, but they were not dismounted, and this was put off till the next day, as it was then necessary to go above the Middle Ground to find a convenient anchorage for the night. Putting aside the safety of the ships, I had to consider that of the crews, as had I remained at the open part of the pass, close to the left bank, commanded by the hills, the enemy's sharp-shooters would have caused me serious losses. We perceived on the following day that our precautions had not been excessive.

On the 28th, at 4 a. m., the Duguay-Trouin and Triomphante weighed anchor, and at daylight opened fire on the two batteries attacked the previous day. These replied at first with some vigor, but they did not last long. The Chinese preferred to depend chiefly on small-arm fire, but the ground was remarkably favorable to that mode of fighting.

On the right bank earthen walls about breast high with loop-holes, and on the left bank bushes and the village of White Fort fort gave shelter.

Our 14-centimeter and Hotchkiss guns slowly dislodged them. We saw them run toward the camp of Kimpai on the other slope of the mountain. A lucky shell blew up the magazine and completed their disorder. At first the village on the left bank offered them a refuge, but they were soon driven out by the flames.

All this time the heavy guns were breaching the battery protected with 15-centimeter armor and the casemate battery of the White Fort, and dismounted all the neighboring guns mounted in barbette, of which the principal was a 21-centimeter Krupp gun commanding the seaward approaches. I finished the work by bursting the guns with gun-cotton.

On the right bank we destroyed half a dozen pieces, but the musketry fire from the heights of Kimpai recommenced, to which we replied, without succeeding in subduing it entirely.

Besides this the landing places on the left bank were sown with electrical torpedoes of which we could not find the wires. The Triomphante exploded two or three with her Hotchkiss guns. Our landing parties would certainly have suffered greatly here, and the results to be obtained by them not being worth the probable loss, I decided to go on. On the left bank there still remained batteries Nos. 5 and 6 and fort No. 1 to be dismounted.

No. 5 battery seemed abandoned, and after a few shots I sent to destroy its guns The work was interrupted by a few chance shots from No. 6, which was out of effective range, but at the same time a large body of soldiers came down from No. 2 fort and caused us some loss. Captain Sango, in command of the party, was wounded, and two officers and eight men who could not rejoin their comrades sheltered themselves behind the sides of a steamer which was ashore in the vicinity. Our shells soon cleared the ground. I sent the Aspic and Lynx to anchor to the east of No. 5 battery, where they swept the valley leading to No. 2 fort. Under this cover an armed boat brought back uninjured the party that had been cut off. At the same time the interrupted work of the previous day was finished by destroying the three guns. Battery No. 6 and fort No. 1 were still uninjured, but they caused me no uneasiness, as I was sure of dismounting their guns without difficulty.

The evening of the 28th we reached an obstacle which, by the best authority obtainable, might be very serious. For a long time a line of rafts had been lying between Pass Island and Salamis Island, but so as to leave a passage on this side. The pilots said these rafts had electric torpedoes on board. We found them in the same position as a month before and the channel seemed as clear as ever it was.

Nevertheless we saw some buoys recently laid down, and on the 25th a German steamer, carrying troops, had been warned not to approach without a pilot from Kimpai, and, from various sources, I had reason to fear the presence of torpedoes. It was necessary to make sure of this before trying to cross the line, no matter what time should be consumed. Besides, from the place where the Duguay-Trouin and Triomphante were lying, I was in telegraphic communication with Sharp Peak, as the gunboats could take the channel south of Salamis at high tide, and so I sent the Aspic to carry dispatches and (by request of the English admiral) to protect the cable-house against pirates

The night of the 28th–29th our boats dragged the channel for torpedoes and examined the rafts.

This double task was ably done by Lieutenants Champion and Merlin, the torpedo officers of the Duguay-Trouin and Triomphante.

The rafts only supported chains, making an extensive barrier, but one that would have given us little trouble to destroy. The new buoys seemed to be fishermen's, and the dragging gave no cause to suspect torpedoes. The 29th, at the first of the flood, the Duguay-Trouin anchored to the east of the rafts, in a favorable position for bombarding No. 6 battery and of forts Nos. 1 and 2. At the same time the other ships of the squadron came out of the river, and the greater part of them reached the anchorage of Matsu on that tide. When all had got by Kimpai Pass the Triomphante weighed in her turn and anchored near the Duguay-Trouin. Two hours later not a single gun of the enemy could be served. The Chinese, who were certainly very careful of their troops, had scarcely tried to return the fire. At this time the Galissonière arrived, having been detained at Keelung by a heavy gale, which prevented her from arriving in time.

The 25th, as soon as he could get a pilot, Admiral Lespes came up to the anchorage of Woga, where he hoped to engage the works of Kimpai, but the narrow channel and swift current prevented him from engaging more than his port turret-gun, while he was threatened by several batteries, and after a few shots he thought it necessary to seek a more favorable position.

While the Galissonière was shifting her berth she was struck on the port bow by a 21-centimeter shell from the barbette battery of the White Fort, which pierced the plating, killing one man and wounding several.

On the 30th, toward evening, the Duguay-Trouin, Gallissonière, and Triomphante arrived at Matsu. The Aspic alone remained at Sharp Point to guard the telegraph line until an English gunboat, which had been ordered from Hong-Kong, should relieve her.

We have suffered severely: Ten killed (including an officer) and 45 wounded (including 6 officers). As for the Chinese, it is impossible to estimate their losses with any precision. To the first estimate, inspired by the terror of the first days, has succeeded a more reasonable one of from 2,000 to 3,000 killed and wounded.

The ships of the squadron are engaged in various repairs, in overhauling engines, and in coaling.

The Nive brings supplies to last until November 15.

This, sir, is a summary account of the events of a fatiguing week. I am happy in telling you that officers and crews can never do better in similar circumstances than these have done.

During the month before I had the pleasure of seeing with what energy they supported the fatigues of a continual lookout, at quarters, and with steam up. They knew an action was at hand and waited for it with secret impatience and full confidence in the result.

The brilliant work of the 23d justified all our expectations. Although the work of the succeeding days was of a less exciting nature the general ardor was not relaxed until the last Chinese gun was dismounted.

I am proud to command officers and men animated by so high a love of country. France may expect anything from their bravery and devotion.

With profound respect, I am, sir, your obedient servant,

A. COURBET.

# REPORT OF THE ACTION BETWEEN THE FRENCH AND CHINESE FLEETS AT PAGODA ANCHORAGE, MIN RIVER.

By Lieut. H. Osterhaus, U. S. Navy.

On August 23, 1884, the negotiations between France and China having failed, Vice-Admiral Courbet, commanding the French forces in Chinese waters, was directed by his Government to make reprisals on the Min River. In anticipation of this event, the French fleet had taken an anchorage off Pagoda Point for more than a month, and had made all preparations for commencing hostilities.

Pagoda anchorage is off the point of the same name, about 25 miles above the mouth of the Min River, and 12 miles below Foo-Chow City. It is the usual anchorage for all vessels of deep draught. The river here makes a sharp turn and is about half a mile wide, but the channel is barely 200 yards wide. A short distance above the point, on the left bank, Ma-moi arsenal is situated, at the foot of Ma-moi hill. This arsenal was built by the French for the Chinese Government, and for many years was controlled and operated by Frenchmen employed for that purpose. Its equipment, outfit, and machinery were all procured from France at a very great cost.

To protect this valuable property and to resist an attack of the French fleet a Chinese fleet of eleven vessels was stationed in the river; but, with the exception of two old stone forts and a field battery on Losing Island, no fortifications were constructed on the surrounding commanding hills.

Upon the Chinese fleet, therefore, devolved the protection of the arsenal. This fleet was composed of the following vessels: The Yung-Woo, a full-rigged corvette, commanded by Captain Chang Sing, the senior officer afloat; the Yung-Pao and Chuen-Hung, transports; the Chang Sheng and Fah-Sheng, gunboats, carrying 1 18-ton Armstrong M. L. rifle; the Foo-Poo, Chi-an, Fei-Yuen, Chuen-Wei, and Fah-Shing, gunboats, and the Yei-Sing, a small vessel used as a practice vessel for cadet engineers, and carrying 3 small brass guns.

In addition to these vessels, about a dozen war-junks, armed with small, obsolete cannon, and manned with large crews, were moored close inshore. These were to be used in carrying some of the French vessels by boarding. Also a number of fire-junks were in readiness to be sent down among the French fleet.

The fortifications to assist the fleet were obsolete works of masonry, situated on Losing Island; one on Pagoda Hill, just to the eastward of the tower, and the other just below the first, close to the water. The former had 14 obsolete guns, about 10-pounders, mounted on wooden carriages; the latter had 6 guns of larger caliber, and equally worthless. Besides these an earthwork mounting 3 field-pieces had been thrown up on Pagoda Hill commanding the lower reach of the anchorage. A visit to these works after the action plainly showed that they played no part in it, and were probably deserted at the first discharge of the heavy guns of the French fleet.

The destruction of the arsenal as well as the protecting fleet was the object of the French admiral. With this end in view he had anchored his fleet in a commanding position around Pagoda Point. The fleet consisted of the Volta, temporary flag-ship, Triomphante, Duguay-Trouin, Villars, D'Estaing, Vipère, Aspic, and Lynx. In addition to these vessels two modern steel torpedo boats of high speed were at hand.

Besides these vessels the admiral had the following vessels of his command in the vicinity: the Chateau-Renaud, anchored lower down the river between Kimpai and Mingan Passes, the Bayard, regular flag-ship, the Galissonnière, flag-ship of Rear-Admiral Lespes, division commander, the gunboat Lutin, and the transport Saône, converted into a gunboat, were lying opposite the mouth of Min River, off the island of Matsu, the base of operations of the French.

For more than a month the French and Chinese fleets had been anchored within short range of each other stripped for battle. During every day of this time the preparations of the different vessels were perfected. The French vessels had been cleared for action by striking light masts and yards, sending down yards on the main and mizzen masts and landing them across the rails and on deck; mounting machine guns, the Hotchkiss revolving cannon, on the lower mast-heads, in the tops, and along the rail; by constructing sheet-iron shields and bulwarks of chain, rope, and canvas to protect exposed parts of ship and the crews, having chain ready for slipping, kedges slung on the quarters with springs bent, temporary torpedo launches rigged and ready alongside each vessel, and steam up to move at any moment. Each of the larger boats of the vessels had a machine gun mounted, and when the ships went into action all the davit boats were lowered to the water's edge.

The vessels were anchored in the following order: The flag-ship Volta above the point with the Pagoda bearing about east, the Vipère, Aspic, Lynx, Duguay-Trouin, Villars, and D'Estaing below the flag-ship in the order named. The Triomphante only arrived a short time before the action commenced and took her station below and near the D'Estaing. The two torpedo boats were anchored close to the flag-ship, with steam up and torpedoes rigged. All the crews of the vessels were considerably strengthened by details from the ships outside. All the guns were manned so as to fight both sides. With the exception of the Volta, all the vessels were of modern construction, and carried heavy batteries of modern breech-loading rifles of French pattern. These guns varied in caliber from 4½ to 9⅜ inches. The whole number of guns of the fleet was 71, with a broadside of 43 guns throwing over 2,300 pounds of metal.

Each vessel had one or more guns mounted to fire directly ahead or astern, and in the four smaller vessels, the Volta, Aspic, Vipère, and Lynx, the batteries were mounted on pivot carriages, to be fought on either side. Each vessel carried four or more Hotchkiss revolving cannon. The larger vessels had two mounted in each top and the smaller vessels one. In the latter a platform was built around the lower masthead, on which the guns were mounted. Besides these each vessel had at least four of these guns mounted along the rail, generally one on each bow and quarter. The tops were protected by iron shields, as were also the guns along the rail. Evidently the vessels outside were stripped of their machine guns to strengthen those that took part in the action.

The vessels of the Chinese fleet were also of modern construction, but of lighter build, except the Yung-Woo, which was a fine corvette, built at the Mamoi arsenal and carrying a good battery. All the vessels were built in China, mostly at the Foo-Chow arsenal. The two smaller gunboats were built at Hong-Kong, after the model of the Alpha-Beta gunboats built by Sir William Armstrong, but they carried only 18-ton guns. This fleet carried but 45 guns, 3 of which were small brass cannon and of little use. Therefore the French guns outnumbered them nearly two to one. These Chinese guns were of the Whitworth, Armstrong, and Vavasseur types, muzzle and breech loading, and varied in caliber from 40-pounders to 18-ton guns. Each vessel, with the exception of the two transports and the Yei-Sing, carried a pivot gun abaft the foremast. The Yung-Woo and the two mosquito boats were the only vessels that had a directly-ahead fire. The former also had a gun mounted to fire directly astern. The Chinese fleet could fire 23 guns in broadside. It carried no machine guns, and during the action the want of them was sadly felt. The officers of the fleet recognized the utility of these arms and had applied for them, but they were refused on some absurd pretext.

This fleet was disposed as follows: The Chi-an, Fei-Yuen, and Chuen-Wei were anchored in the lower reach, off the custom-house, on the right shore, abreast of the larger vessels of the French fleet. The other vessels were lying in the upper reach above the Volta; the Yung-Woo within 200 yards of her. The ships were cleared for action in a similar manner to those of the French as far as the means at hand would permit. The fleet was under the disadvantage of orders from the Government at Pekin to act entirely on the defensive.

Such was the condition and disposition of the two fleets on the day of action. No one who saw them lying so close together, stripped for battle, could have a doubt as to the issue of an action between them, and yet no one was altogether prepared for the scene of that day.

The French commander-in-chief had given due notice to all the foreign vessels as to the time of commencing hostilities. His plans were all made, and all his commanding officers had received their instructions, and were ready to begin the battle as soon as the signal was made. The officers and crews of his fleet were anxious for the preconcerted signal to open fire, and when it was made on the afternoon of the 23d of August their response came quickly. The admiral selected the beginning of the ebb tide as the best hour to open fire. The Chinese vessels above his ship, not having anticipated him by dropping a kedge astern, presented their sterns to the bow guns of the French ships, and had to turn partially before they could bring their guns to bear.

The signal, the discharge of a machine gun in one of the tops of the Lynx, was given at 1.56 p. m., and was answered immediately by the batteries and machine guns of all the French vessels. The Yung-Woo replied at once with her stern gun, and the other vessels as soon as they could bring their guns to bear. The action at once became general and the scene was soon enveloped in a dense smoke. At the signal the two torpedo boats launched out on their errand of destruction. The admiral in his flag-ship, with the Lynx, Aspic, and Vipère, slipped and moved up against the Yung-Woo and the vessels lying above him. To the Villars, Duguay-Trouin, and D'Estaing, assisted by the Triomphante, which came into action shortly after it began, was allotted the destruction of the three gunboats anchored abreast of them and in silencing the works on Pagoda Point.

The Triomphante, which had been discovered coming in about 1.30 p. m., opened fire with her bow gun when about a mile off, and stood up to her station off the custom-house and near the D'Estaing.

Four minutes from the commencement of the action a heavy explosion told the successful work of the torpedo boat detailed to destroy the Yung-Woo. In this short time, and before the Yung-Woo was fairly in action and had brought her guns to bear, the torpedo had done its deadly work and had destroyed this fine vessel. The officer in charge of the torpedo boat had successfully placed a torpedo under her counter while she was in the act of turning. It nearly blew her out of water, and the vessel soon sank, on fire fore and aft, a total wreck. Many of her officers and crew perished. She lies close inshore, 100 yards above the point.

The torpedo boat dropped down the river out of action, her commander and one of her crew having been wounded, probably by one of the French machine guns.

Soon the whole scene was enveloped in smoke, nothing could be observed, and the effect of the incessant discharge of the heavy guns and machine guns was deafening. In about fifteen minutes the fire slackened and as the smoke rose, the complete destruction of the Chinese fleet was disclosed, while the French vessels appeared uninjured. The Chuen-Wei was sinking at her anchors, riddled by shot, on fire from stem to stern, carrying most of her officers and crew down with her. She was gallantly fought, and went down with her colors flying and guns firing. She was overpowered by her antagonists and one of the torpedo boats finished her. The two other vessels near her, the Fei-Yuen and Chi-an, met a similar fate. They drifted down the river total wrecks, in flames, and finally sunk near Flat Island. These three vessels could make no impression upon their opponents, the largest French vessels, and most of their officers and crews must have been cut down by the machine guns in the tops. They were riddled with shot.

The admiral, with the French gunboats, did equally destructive work above the point. All the Chinese vessels above him were sunk, and, with the exception of the Foo-Poo, were total wrecks. The commander of the Foo-Poo ran his vessel up the river, after receiving several shots. She sank and broke her back. One of the mosquito boats drifted down the river, a helpless wreck. Her decks were covered with dead and wounded, and she sank near the foreign shipping, a short distance below the point. About an hour after the action began one of the gunboats above the point, the Fah Shing, drifted down the river in flames, with the French colors flying. She had been carried by boarding, and passed out of sight through Mingan Pass. Two hours afterward a heavy explosion down the river told the story of her sad end. About 8 o'clock one of the transports which had been destroyed drifted down the river in flames, burned to the water's edge. She was sunk in a few moments by the French vessels before she exploded. (This was some time after these vessels had resumed their anchorages.) The war-junks played no part in the action, and only served as targets for the French gunners. They were mostly sunk at their moorings. A number of fire-junks drifted down the river without doing any harm, and they passed out of sight below the pass.

In less than half an hour the entire Chinese fleet was destroyed, and all that could be seen of the fine fleet were hulks in flames, or sunken vessels. The French gunboats took position off the arsenal and kept up an active bombardment until sunset, when the fleet returned to their anchorage. The Chinese troops on the hills back of the point occasionally received attention with a few shell, which soon effected a retreat to safer quarters. During the night the electric light was actively employed to discover any movements on the part of the Chinese, and the occasional discharge of a gun reminded them of the alertness of their opponents.

The French fleet received no injury in any of its vessels. They were apparently unhurt after the action. The only casualties that occurred to them were on board the Volta, whose crew lost 6 men and the pilot, an Englishman engaged by the French. These men were killed by the first discharge of the guns of the Yung-Woo; a shell striking the bridge near the admiral.

The Chinese loss in killed and wounded must have been very heavy, being variously estimated from 800 to 1,500. The former number is probably the more correct. Many lost their lives in attempting to swim ashore, but the greatest destruction was occasioned by the machine guns, which rained their explosive shells upon the decks, cutting down the crews at the guns so that they could hardly reload them. Their fire demoralized men and officers, and drove them to seek shelter and escape by jumping overboard. The decks of the vessels as they drifted down the river were covered with dead and wounded. To these guns may also be ascribed the rapidity and thoroughness with which the vessels were set on fire.

The importance of this class of armament was clearly demonstrated in this action and the conditions for their use were the most favorable. No modern man-of-war will be efficient without them. Her crew would be at the mercy of an opponent armed with them.

The accuracy and rapidity of the French fire were remarkable, fully demonstrating the advantage of the breech-loader over the old muzzle-loader. Notwithstanding the exposed position of the buildings on Pagoda Point they were hardly struck by shot, and then only by a few shell of the machine guns.

On the morning following the battle the launches and boats of the fleet were sent to destroy the junks which had collected in the creek just above the custom-house for piratical purposes. The junks were destroyed and many of the crews were killed; the rest escaped over the hills. The gunboats got under way and resumed the bombardment of the arsenal, where a great deal of valuable property must have been destroyed. It would have been entirely demolished had the French admiral considered it safe to land men. It was reported to have been mined, and this no doubt deterred the admiral from risking his men. While the gunboats were thus engaged, the larger vessels occasionally threw shells into the camps upon the hills and made it dangerous for any one to show himself.

This was kept up during the greater part of the day. In the afternoon the French landed at the custom-house and buried their dead.

On the morning of the 25th they landed parties at the custom-house and at the point, clearing the way with their heavy guns and holding the troops on the hill in check by an occasional shell. They did not take formal possession at these points. At Pagoda Point they took possession of the field-pieces mounted there, and carried them off to their vessels. In the afternoon the French admiral transferred his flag to the Duguay-Trouin, with which vessel he led the attack on the forts at Kimpai and Mingan Passes. The fleet got under way and stood down the river. With the exception of the Triomphante and the Duguay-Trouin, the vessels anchored above the pass. The two vessels named bombarded the forts, but met with no resistance as all the guns were mounted to repel an attack from below, and during the long time that the French fleet was anchored above them with hostile intentions no attempt had been made to resist an attack. They could not bring a gun to bear upon the French ships, which thus took them in the rear, and in fact not a gun was fired against these ships.

During the remainder of this day and on the morning of the following, the 26th, the bombardment was continued, the small vessels going close to the shore, which is very bold, sweeping the hills with their machine guns.

After having battered down the works at the pass, a force was landed and destroyed all the modern guns by blowing them up with gun-cotton. The ships covered the party with their guns.

The loss to the French was inconsiderable, no resistance whatever having been offered. The works consisted of old masonry fortifications, strengthened here and there by earth embankments. They mounted a number of heavy rifled guns of Krupp manufacture. From the Mingan forts the fleet proceeded to those at Kimpai and repeated the same tactics. They met no enemy to annoy them in their operations. As they moved down the river they destroyed every semblance of fortifications, and with their machine guns cleared the hills of all Chinese. The only losses they sustained were from troops firing from behind the crest of the hills where they could not be reached. In all their operations on the river the French lost less than 50 men in killed and wounded. But 1 officer was killed. Having thus completed his operations, the French admiral withdrew with his fleet and anchored off Matsu Island, leaving a vessel to guard the telegraph at Sharp Peak.

During the afternoon of the 24th, while the operations at Pagoda anchorage were in progress, the Galissonnière steamed into the river evidently with the intention of feeling the forts at Kimpai Pass. When she was within 2 miles of them the forts opened fire, to which she promptly replied. At first the firing was wild, but soon the Chinese got the range and succeeded in striking her, when she withdrew. This shot was from one of the heavy Krupp guns and would have inflicted very serious injury on the vessel had it been filled with powder instead of charcoal. It entered just abaft the foremast, and lodged on the berth-deck. As it was, it necessitated a visit to Hong-Kong to make the repairs.

Whatever may be thought of the disparity between the two hostile forces, all admit that the operations were conducted in a masterly and brilliant manner on the part of the French. Admiral Courbet conceived his plans well and clearly impressed them upon the minds of his subordinates, who when the time came carried them out in the most thorough and efficient manner, winning the admiration of every one.

### *Description of the French vessels that took part in the action at Pagoda Anchorage.*

*Triomphante.*—Sea-going iron-clad, second class, with ram; 4,127 tons displacement; 5⅞-inch armor; central battery and belted; six 9⅜-inch B. L. rifles, four in central battery and two in barbette turrets on spar-deck; one 7⅜-inch B. L. rifle under forecastle to fire ahead, and six 5½-inch B. L. rifles on spar-deck.

*Duguay-Trouin.*—Iron cruiser of second class, with ram; 3,289 tons displacement; unarmored; five 7⅜-inch B. L. rifles, four in sponson turrets and one under top-gallant forecastle, with fire directly ahead; five 5½-inch B. L. rifles on spar-deck, one firing directly astern.

*Villars.*—Wooden cruiser, second class; 2,268 tons displacement; fifteen 5½-inch B. L. rifles on spar-deck, two on top-gallant forecastle to fire ahead, and one aft to fire astern, twelve in broadside.

*D'Estaing.*—Wooden cruiser, second class; 2,236 tons displacement; fifteen 5½-inch B. L. rifles; carried as in Villars.

*Volta.*—Old wooden gunboat; 1,200 tons displacement; four B. L. rifles, two of 5½-inch caliber and two 4-inch. The former carried on spar-deck, on pivot-carriages abaft and forward mainmast, the latter on poop and top-gallant forecastle.

*Lynx, Aspic, and Vipère.*—Gunboats of 471 tons displacement, carrying the same battery as the Volta, and mounted in the same manner. The Lynx is a ram.

Also two steel torpedo boats, about 50 feet in length, of high speed, armed with spar torpedoes.

*Description of Chinese vessels that took part in the action at Pagoda Anchorage.*

*Yung-Woo.*—Composite, full-rigged corvette, of 1,393 tons displacement; carried eight 3-ton ½ M. L. Whitworth rifles, six in broadside, one under forecastle, firing directly, and one aft to fire astern; one 6½-ton M. L. Whitworth rifle abaft foremast on pivot-carriage.

*Foo-Poo.*—Gunboat of 1,258 tons displacement; carried six 45-pdr. B. L. Vavasseur rifles in broadside and one 10-inch smooth-bore M. L. on pivot-carriage abaft foremast.

*Fei-Yuen.*—Gunboat of 1,258 tons displacement; carried six 45-pounder B. L. Vavasseur rifles in broadside and one 4-ton Armstrong M. L. on pivot-carriage abaft foremast.

*Chi-an.*—The same as Fei-Yuen.

*Chuen-Wei.*—Gunboat of 572 tons displacement; four 45-pdr. B. L. Vavasseur in broadside, and one 4-ton Armstrong M. L. rifle on pivot-carriage abaft foremast.

*Fah-Shing.*—Gunboat of about 500 tons displacement; two 45-pdr. B. L. Vavasseur and two 40-pdr. M. L. Whitworth rifles on spar-deck in broadside, and one 4-ton Armstrong M. L. rifle abaft foremast on pivot-carriage.

*Yei-Sing.*—Small gunboat of about 400 tons displacement; carried three small brass cannon.

*Yung-Pao and Chuen-Hung.*—Transports of about 1,400 tons displacement. Three guns.

*Chang Sheng and Fah Sheng.*—Armed with one 18-ton gun each, something like the Alpha class, but inferior.

# EFFECT OF THE BOMBARDMENT OF THE FRENCH FLEET ON FOO-CHOW ARSENAL.

(By Lieut. H. Morbell, U. S. Navy.)

Sir: I have the honor to submit the following report of an inspection of the Naval Arsenal, Pagoda Anchorage, Min River, made December 23 last, with a view to ascertaining the damage sustained during the bombardment on the 23d and 24th of August last:

Through the kindness of a gentleman connected with the Chinese Imperial College, permission was obtained to visit the arsenal.

There were no foreigners employed in the establishment, and as no information could be obtained from the Chinese official and it was not considered advisable to make notes, data for a detailed report could not be procured, and a general idea only of the effect of the bombardment can be given.

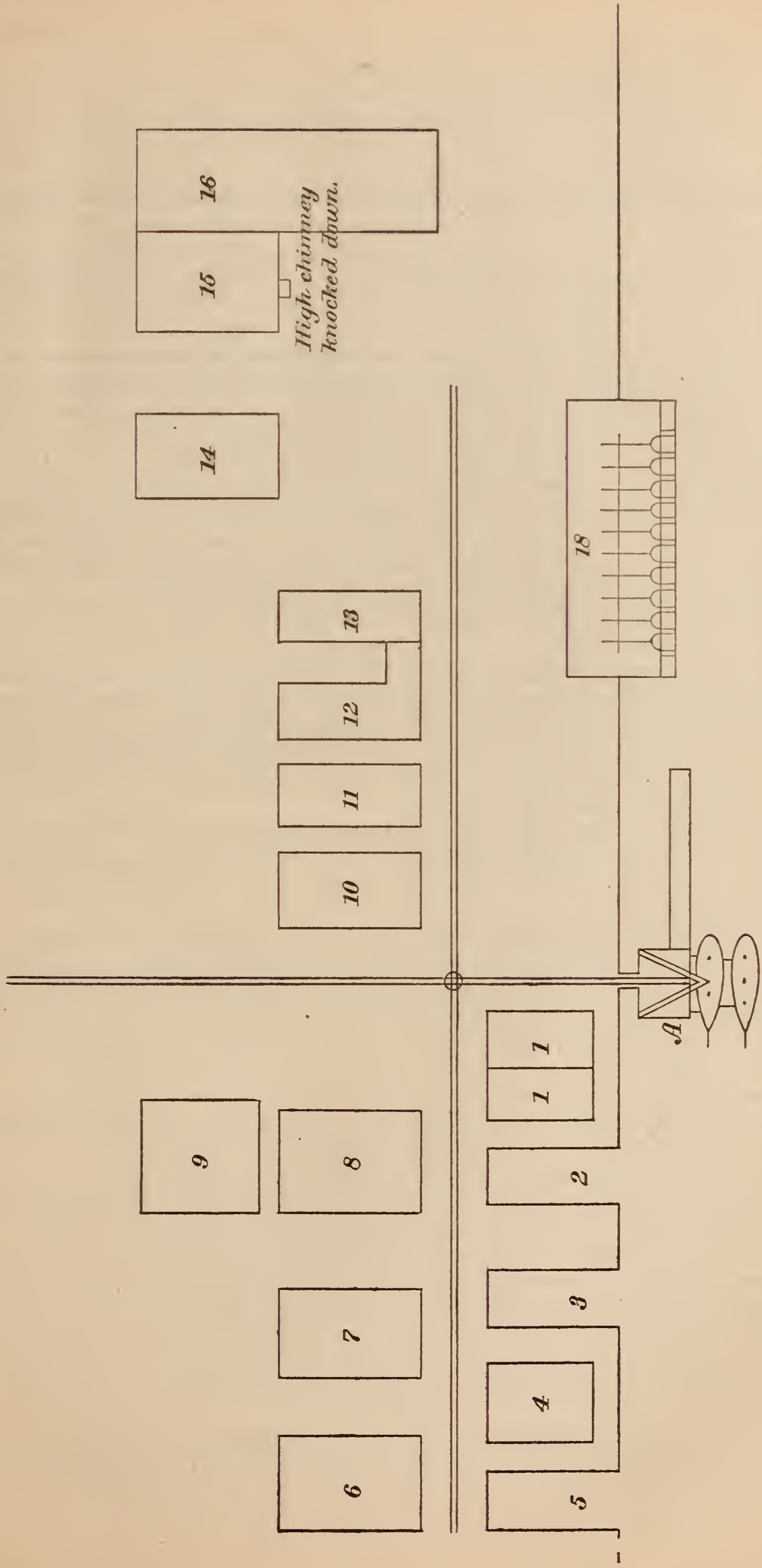
A landing was made at the iron pier, marked A in the accompanying sketch, which supports the shears used for handling boilers, machinery, &c. The pier and shears were in good condition, and showed no signs of having been struck. Alongside were the Foo-Poo and a gunboat of about 500 tons, lately launched. Workmen were busy completing the latter and repairing injuries received by the former during the engagement and while aground at Limpoo. The boat-building sheds 1, 1 were slightly damaged; the building slips 2 and 3 were hardly touched, only a few Hotchkiss shells having struck the uprights of the ship sheds. On each of these slips was laid the keel of a composite gun vessel of about 600 tons, with about twelve of the forward frames in place. This work was not injured. The gunboat launched since the engagement, on building slip marked 5, was pierced about eighty times and greatly damaged. The boat-building shed 4 was nearly demolished, and has since been rebuilt. The pattern and carpenter shops 6 and 7 had not been touched, and together with the adjoining shops 8 and 9, used for bending iron ship frames and plates, were in full operation. The small-tool machine-shop 10 had apparently escaped without any injury, as no marks could be found on the building, and the machinery was in operation.

The front of the foundry 11 had been pierced several times; no signs of internal damage; foundry in operation. The large-tool machine-shop 12 is two-storied, with the second floor devoted to offices, designing and drafting rooms. The latter had been severely handled, and the front of the building on the ground floor penetrated about five times. The machinery showed no evidence of injury from the bombardment, and every tool was found at work. In the small wing setting off from the front of their building are two large wooden cranes traveling on a railway. The wall abreast these had been pierced about five times, the only perceptible damage being the carrying away of a few braces and the imbedding of several pieces of shell in the uprights. They were not disabled. The ordnance building 13 was struck three times, but nothing inside was injured. Here were stowed large quantities of torpedoes and shells, loaded and unloaded, four Krupp field-pieces, and three Vavasseur guns of small caliber. The front of the boiler shop 14 was penetrated eleven times. The front half of the shop was empty, only the beds of the different apparatus being in place, while in the rear half work was going on as usual.

The rolling mill 15 and blacksmith shop 16 were only slightly injured. The high chimney of the former had been knocked down, but the plant seemed uninjured, and in the blacksmith shop nearly every tool and hammer were at work. The marine railway 18 was damaged considerably and was still under repairs. It will probably be in working order in a short time.

Taken as a whole the injuries received were slight, and a good estimate of their extent may be found from the fact that only three months after the bombardment the Chinese were able to launch a vessel that had been much damaged.

Two reasons may be assigned for the comparatively slight damage inflicted. First, the inefficiency of shell fitted with quick-acting impact fuze used against brick walls of moderate thickness; second, the forbearance of the French.


High chimney
knocked down.
A

## *REPORT OF VICE-ADMIRAL COURBET TO THE MINISTER OF MARINE.*

MATSOU, *February* 17, 1885.

SIR: I have the honor to report the results of a cruise I have just finished along the coast of China with the Bayard and several vessels of the squadron of the Extreme East.

The Chinese had assembled in the Yang-tse-Kiang a squadron composed of five ships, consisting of two steel cruisers, the Nan-Tchen and Nan-Choni, built at Kiel; the cruiser Kai-Tsi, built on the same model at Foo-Chow, the Yu-Yuen, a frigate of 3,400 tons, and the corvette Tcheng-King, of 1,300 tons (Dupleix type).

These ships decided to put to sea in the latter part of January.

I left Kelung on February 5, at 4 p. m., with the Eclaireur, the Saône, and the Aspic; the next day I was joined by the Triomphante, Nielly, and Duguay-Trouin.

Between the 6th and the 12th of February I visited several points along the coast of China, and on the morning of the 13th the Eclaireur and Aspic, which had been sent in advance, reported five sail in sight. I headed for them.

The Chinese fleet, doubtless warned by a lookout ship, made off immediately; we were about 5 miles astern.

After having rounded the northern sides of the Medusa, Tunis, and Sanchesan Islands, the three, Nan-Tchen, Nan-Choni, and Kai-Tsi, turned to the south, and seemed for an instant to slow down and rectify their line. I thought they were going to fight, but this illusion was short, for soon we saw them running to the southward at full speed. The frigate had headed at the same time for Sheipou, and the Tcheng-King after a moment's hesitation followed her.

I left the Triomphante, Saône, and Aspic to watch these two, and followed the three cruisers with the Bayard, Nielly, and Eclaireur. At 9.40, the fog getting thicker, I abandoned the chase and returned to the neighborhood of Sheipou to make sure of the frigate and corvette.

I immediately sent the Eclaireur and Nielly to the anchorage east of Tung-Moon, while the Bayard anchored in Sheipou Roads. The eastern passes were thus well guarded. On their side the Triomphante and Saône the southern ones, and the Aspic reconnoitered there. As soon as at anchor I sent Lieut. Ravel in a steam launch to the head of the pass, between Sin and Nyew-tew Islands, to see if the Chinese frigate and corvette were at anchor.

Before risking our ships in the Sheipou Passes I thought it necessary to reconnoitre, and the Aspic and Eclaireur were sent to do so. But while waiting for their report I decided to try an attack by the two torpedo launches of the Bayard.

The weather being too bad during the night of the 13th–14th the attack was postponed to the following one. The Chinese new year coming on the 15th I hoped celebrations on its eve would decrease vigilance and make surprise more easy.

Accordingly about midnight our boats left with the intention of attacking the frigate. One was in charge of Commander Gourdon, commanding, and the other in charge of Lieutenant Duboc. Lieutenant Ravel, who had seen the Chinese vessels and examined the channel, piloted them. He was also to afford them assistance and afford a rallying point at the conclusion of the affair. Mr. Muller, a pilot for the Yang-tse-Kiang, who has been in the French service since last July also accompanied the expedition.

On account of the difficulties of navigation and the insufficient speed of our steam launches, the expedition did not get near the Chinese ships till half-past 3 in the morning. Guided by Lieut. Ravel our torpedo boats saw the frigate at about 700 or 800 metres. They headed for her at the greatest speed possible without making too much noise. Commander Gourdon's boat going faster than the other, they lost sight of each other for an instant. The ships and shore kept a good lookout. There were men at the guns at the Nordenfelts and riflemen on deck and in the tops. Our boats were discovered before getting up, and were received by a warm fire from the frigate, which was supported from the shore. Our boats put on full speed. Commander Gourdon struck first right astern. The torpedo exploded, but the boat could not get away, as her spar was caught, and she had to unscrew its fittings to let it go. In this critical position a man was killed by a shot from the shore.

This boat was backing off when Lieut. Duboc's boat came up at full speed, struck the frigate on the starboard quarter, and exploded her torpedo. The engine had been reversed before the collision, and she got clear at once, and the two boats made off together under fire of the enemy's small arms and machine guns.

Carried on by the current, these two boats passed the place where Lieut. Ravel was waiting for them, and did not see his rallying light. The two groups of boats looked for each other until day, and then were obliged to return.

Lieut. Ravel came on board the Bayard after having been able to see by the light of early dawn that the corvette was sunk and lying heeled over. The frigate seemed upright, as if she was unhurt.

It was learned later, at low tide, that the two Chinese ships were sunk, the frigate being upright and sunk half way to her tops, the corvette being inclined and sunk to her rail. It seems probable that the corvette was sunk by the fire of the shore batteries and frigate against our boats.

The frigate Yu-Yuen was a fine ship of 3,400 tons, built at Shanghai, on the plans of American constructors, about twelve years ago. She was armed with twenty-three breech-loading guns, twenty of which were in broadside and three on the forecastle and poop. She had also some Nordenfeldts.

The corvette Tcheng-King was one of the last ships built at Foo-Chow, and carried 7 guns.

# REPORT OF VICE-ADMIRAL COURBET TO THE MINISTER OF MARINE.

The minister of marine has just received from Admiral Courbet the details of the capture of the Pescador Islands, which took place March 29 last.

The expedition was composed of the Bayard, Triomphante, D'Estaing, Duchaffaut, Vipère, and Annamite, which had on board two companies of marine infantry and a section of 80-millimeter mountain guns, commanded by Chef de Bataillon Lange, of the marine infantry.

These troops were reinforced for the operations on shore by the landing parties of the Bayard, Triomphante, and D'Estaing, with two sections of 65 millimeter guns.

On the 29th, at 7 a. m., an attack was made on the casemated fort and four batteries which defended the ports of Ponghon and Makung.

At 10 o'clock most of the guns were dismounted and the fort dismantled; two magazines had blown up. A large fire broke out in the village of Makung, which burnt for twenty hours.

A chain barrier had been placed at the entrance to Makung, and during the night the admiral sent two aides-de-camp to examine it. In the morning the boats of the Triomphante, under Lieut. Talpomba, destroyed it. One man was killed here.

During the bombardment the ships, which were well handled, kept in the dead angles, and were untouched.

The landing parties disembarked on the 29th near Dome Peak, marched on Makung on the morning of the 30th, supported by the fleet both inside and outside the port. After several encounters the French occupied Makung on the evening of the 31st. A company of marine infantry occupied Lixsitah Light the next day. The French losses on shore were 4 killed and 12 wounded. The Chinese garrison, 1,500 strong, suffered considerable loss.

# UNITED STATES NAVAL OPERATIONS

ON THE

# ISTHMUS OF PANAMA,

APRIL, 1885.

# REPORT OF COMMANDER McCALLA

UPON THE

# NAVAL EXPEDITION TO THE ISTHMUS OF PANAMA,

APRIL, 1885.

NAVY DEPARTMENT, BUREAU OF NAVIGATION,
*June* 8, 1885.

SIR: I beg leave to submit a report of the service performed by the naval force recently under my command on the Isthmus of Panama.

In compliance with the Department's instructions of April 2, I proceeded to New York and reported to the commandant of the navy-yard as the Commanding Officer of the Force to be sent to Aspinwall, United States of Colombia. These instructions directed me to organize that force.

The force consisted of the First Battalion of Marines, about 200 strong, the Second Battallion of Marines, 259 men, and the available Blue-jackets at New York, numbering about 280 in all.

The First Battalion of Marines, under Major and Brevet Lieutenant-Colonel Heywood, U. S. M. C., with Asst. Surg. F. N. Ogden, U. S. N., sailed in the City of Para (delayed one day at the request of the Department), at 2 p. m. on April 3.

Lieut. T. B. M. Mason, U. S. N., who had been ordered to New York on the 2d of April, was instructed by me to drill the Blue-jackets in the use of rifles and gatling and field guns twice each day. This he did with zeal and ability. Lieutenants Southerland and Mentz and Junior Lieutenant Walling were directed by the Commandant to assist Lieutenant Mason.

On the 4th of April the Blue-jackets were separated into two battalions of three companies each, to facilitate their instruction. On the 5th I was ordered by the Department to go in the Acapulco with the Second Battalion of Marines, the necessary Blue-jackets for six guns, and such of the officers as had been ordered by the Department for service on the Isthmus as I might elect to take with me.

Lieut. William S. Cowles was appointed Adjutant-General of the force, and Lieut. W. H. Reeder, A. D. C. Surg. G. A. Bright had been or-ordered to report for duty, but not arriving in time for the steamer, his place was filled by Passed Asst. Surg. R. Whiting, U. S. N., who volunteered for this service. Paymaster Stephen Rand, U. S. N., reported for duty on the 6th of April, and Mr. James Gregory was appointed paymaster's clerk.

Lieutenant Allibone was ordered to command one battalion of three Gatling guns, and Lieutenant Mason was given a battalion of three 3-inch B. L. R. guns. Lieutenants Badger and Sharp, and Gunner J. J. Walsh commanded the gatling gun sections; Lieutenants Kellogg and Colwell, and Ensign Witzel commanded the sections of rifled guns. The organization of the force is shown on the inclosure marked A.

At 1 p. m. of April 7 the force was transferred to the Pacific Mail steamship Acapulco in the navy-yard tugs, and the Acapulco sailed at 4 p. m. of the same day.

I had received the following orders on the 6th:

NAVY DEPARTMENT,
*Washington, April* 5, 1885.

SIR: You will proceed with a detachment of marines and blue-jackets per Pacific Mail steamer Acapulco to Aspinwall and report to the senior naval officer present for duty in connection with opening the transit and protecting and caring for the lives and property of American citizens upon the Isthmus of Panama. You will have command of the entire force sent from New York for the above purpose, subject to the orders of the admiral commanding the North Atlantic Squadron, or of the senior officer present, the force sent by the City of Para and by the Acapulco being considered as your particular command.

You will take every precaution to protect the health and lives of the officers and men placed under you, and while taking all the necessary steps to have your command in the highest state of efficiency, you will expose it to the trying climate of the Isthmus no more than is absolutely necessary.

Very respectfully,

W. C. WHITNEY,
*Secretary of the Navy.*

Commander BOWMAN H. MCCALLA,
*U. S. Navy, Navy-Yard, New York.*

A daily routine was established (appended, marked B), and the command was exercised morning and afternoon. Opportunities were afforded all for target practice at floating targets, and Passed Assistant Surgeon Whiting instructed officers and men in the general principles of anatomy, the use of bandages and tourniquets, recommending certain sanitary precautions to be adopted in the climate about to be encountered.

There was some confusion the first evening out, but the steamer's accommodations were excellent, the fare good, and after a pleasant passage of eight days the Acapulco came to anchor off Colon at 9 p. m. of the 15th of April. During that day, in order to prepare for landing at once in case of necessity, two days' rations were served out, and the ammunition boxes of the 3-inch rifles and gatlings were supplied with shell, shrapnel, and small-arm ammunition. Each man carried forty cartridges, his blanket rolled with a change of clothing, canteens, and haversack.

As it turned out, there was no necessity for landing the force that night; early the following morning the Acapulco hauled alongside wharf No. 1 of the Panama Railroad Company, which had been partially rebuilt, and at 9 o'clock Rear-Admiral Jouett inspected the command, expressing himself as well pleased with its appearance.

Rear-Admiral Jouett had arrived on the afternoon of the 10th of April, in the flagship Tennessee, accompanied by the Swatara. The marine garrison stationed at Pensacola, Capt. R. Meade, Second Lieut. Arthur H. Clark, seven non-commissioned officers, twenty-eight privates, and two musicians came down in the flagship.

On the 11th of April the transit had been formally opened by Rear-Admiral Jouett, and on the arrival of the Acapulco on the 15th, the regular trains were running under the protection of train guards from Admiral Jouett's squadron. Two armored platform cars had been prepared under the direction of Lieutenant Kimball, U. S. N., and were attached to the 11 a. m. train each way. These cars were protected on the sides and ends by plates of boiler iron, and were covered with water-proof roofs, each being armed with a Hotchkiss revolving cannon, one gatling, and one 12-pounder howitzer.

Lieutenant Colahan, U. S. N., commanded the Colon garrisons, composed of officers and men from the vessels of the North Atlantic Squadron. Passed Assistant Paymaster Martin, of the Alliance, had charge of the stores on shore and acted as quartermaster and commissary.

At Matachin, a turbulent center, there were stationed Captain Meade's company of marines and a force of blue-jackets from the Tennessee, all under command of Lieutenant Impey, U. S. N., with Passed Assistant Surgeon Ashbridge, U. S. N., as medical officer.

In compliance with instructions from Rear-Admiral Jouett, appended and marked C, the force was landed; the garrisons at Matachin and Colon were relieved that day, and Lieutenant Mason was directed to relieve Lieutenant Kimball in time for the early train of the 17th. Copies of the instructions to the several Commanding Officers are appended, marked D.

It was found practicable a short time afterwards to discontinue the use of armored cars, and later, in consequence of the discomfort entailed upon the men by the first arrangement, it was expedient to furnish train-guards from each end of the line, who exchanged as the trains passed each other.

The force assigned to duty on the Isthmus was distributed as follows:

### COLON GARRISON.

[See plans E, F.]

Capt. J. H. Higbee, U. S. M. C., was assigned to command the naval force at Colon.

*Post* 1, *Capt. R. S. Collum, U. S. M. C., Commanding.*—This post commanded the water approach from the eastward, and the garrison was quartered in the building occupied by the mechanics of the Panama Railroad Company, near the hospital.

*Post* 2, *Capt. F. H. Harrington, U. S. M. C., Commanding.*—This post is on the beach near the church, an eighth of a mile nearer the center of the town than post 1. The men were quartered in a house marked D on plan E.

*Post* 3, *Lieut. T. B. M. Mason, U. S. N., Commanding.*—This garrison was quartered in a series of six houses shown on the appended plan E, marked I.

*Post* 4, *Lieut. C. O. Allibone, U. S. N., Commanding.*—This garrison was quartered at the Pacific Mail Steamship Company's wharf and guarded the causeway or approach by land to Colon, and the wharves and property belonging to the steamship company. (See plan F.)

The quarters for posts 1, 2, and 3 were furnished by the Panama Railroad Company, and those for No. 4 by the Pacific Mail Steamship Company.

## THE DISTRICT OF MATACHIN.

### MATACHIN.

*Post* 1, *Capt. R. W. Huntington, U. S. M. C., Commanding.*—The garrison was quartered in the railroad station, the officers having the paymaster's car on a siding assigned to them.

### SAN PABLO.

*Post* 2, *First Lieut. G. F. Elliott, U. S. M. C., Commanding.*—The garrison at San Pablo was quartered in a fine house loaned by the courtesy of the Director-General of the Panama Canal Company. The post at San Pablo was an important one, as it commanded the approaches to the Barbacoas iron bridge over the Chagres River. A guard tent was put up at either end, and a small earthwork commanded the bridge and approaches.

This post was established on the 16th of April, in compliance with the following telegram addressed to Captain Huntington, viz:

[Telegram.]

COLON, *April* 16—4 p. m.

Captain HUNTINGTON,
*Matachin:*

Send twenty-five men and two officers back to San Pablo by special to-night to guard Barbacoas Bridge over Chagres River. Commanding officer at San Pablo garrison must ask Chief of canal what barracks he is to occupy, as agreed to-day with the director-general.

B. H. McCALLA.

The garrison at Panama was commanded by Maj. and Bvt. Lieut. Col. Charles Heywood, commanding the brigade of marines, and was quartered in the freight offices, old passenger station, and in two large freight-houses, well located, and open at both ends. The freight-houses belonged to the Canal Company. The strength of these several garrisons is appended, marked G.

## THE POLITICAL SITUATION.

In order to make plain the political condition of the Isthmus, it is necessary to refer to the elections of last summer in Panama and the subsequent events.

The President of each of the eight States forming the United States of Colombia, as well as the National Executive, are elected for terms of two years. Each State is independent in the management of its local affairs. The elections in Panama occurred last summer, and two candidates were balloted for, viz; Señors Arosemena and Lambert. The former is said to have had the support of the Government at Bogota. Although the results of the balloting were disputed, it was claimed that Señor Lambert had been elected.

The Constitutional Assembly, composed of thirty-two members, met on the 6th of last January, decided that there had been no election, and proceeded to elect a President, as provided for by law.

General Santo Domingo Vila, who came to the Isthmus last November as a fiscal agent of the General Government to examine into the contracts between the Panama Railroad Company and the State, was chosen President of the State of Panama, January 7, by the Constitutional Assembly. Señors Arosemena and Vivas Leon were chosen or appointed First *Designado* and Second *Designado*.

The office and duties of the *Designado* are similar to those of Vice-President, and in the event of the death or the absence of the President they succeed successively to the presidency.

The other officers of the State government, such as Secretary of State, Governor of Panama, Prefects, &c., are appointed by the President. The Commander-in-Chief of the Colombian (National) forces is appointed from Bogota, and that office was filled by General Gonima.

The steamer Boyaca, which later on performed valuable service for the National Government, was lying off Panama, formed part of Gonima's force, and was commanded by Colonel Ulloa. The Boyaca, intended for the revenue service of Colombia, had been built at Wilmington, Del., by the Pusey & Jones Company, in 1883 and 1884, and was a staunch craft, about the size of our sea-going revenue cutters. The Colombian Government having asked that a United States naval officer might inspect the Boyaca to determine whether the specifications in the contract between the Government and the Pusey & Jones Company had been carried out, and whether she was likely to fulfill the conditions required of a revenue cutter, Commander J. W. Philip was detailed for the duty. Commander Philip having reported, on January 16, 1884, that the Boyaca fulfilled the requirements specified, and was likely to prove most efficient, she was accepted by the Colombian Government.

In February a portion of the national forces stationed on the Isthmus was sent to Buenaventura, the sea-port of the State of Cauca, about 300 miles south of Panama, to aid in suppressing the revolution which had broken out in that State. About the 1st of March General Vila, obtaining two months' leave of absence, sailed himself with more national troops for Carthagena, to help suppress the rebellion in the State of Bolivar. The strength of the national forces having been thus reduced in Panama, those who were discontented with the result of last summer's election took the opportunity to attempt a revolution.

First *Designado* Arosemena had succeeded to the presidency of the

State in the absence of Santo Domingo Vila, and General Gonima, the commander-in-chief, was in Colon.

General Aizpuru, who had been president of the State of Panama for one term, six or seven years ago, and who had served in the national legislature, was recognized as the leader of the liberal party in the State. On the 16th of March he made a demonstration against the Government which caused Señor Arosemena to take refuge on Her British Majesty's ship Heroine, then lying off Panama; broke open cars; opened and blocked switches; obstructed the road; prevented repairs to the same; cut the telegraph wires; seized and held railroad employés; claimed the right to exercise a censorship over the telegrams; and made it necessary to close the transit. General Gonima, hearing of this demonstration on the part of Aizpuru, proceeded by train to Panama with the national force then stationed at Colon. When Gonima arrived, on the 17th of March, Aizpuru retired from the city, and Señor Arosemena returned from the Heroine.

Colon was now without troops. Prestan, a Haytien negro, with a trace of white blood, the leader of a faction of the radical wing of the liberal party, took advantage of the opportunity and seized that city. Aizpuru and Prestan were pronounced in their dislike to all foreigners on the Isthmus, especially to the Americans living there, and this feeling was made use of to incite their adherents and hold them together.

About the 20th of March Arosemena resigned. Vivas Leon should then, in the absence of Santo Domingo Vila, have succeeded to the presidency of Panama, but was prevented by General Gonima, who declared himself the "military and civil chief of Panama." This title and office are established by law; the National Government may, under certain circumstances, make such an appointment. It is very questionable, however, whether General Gonima had a right to seize the reins of government, more particularly since the Second Designado, Señor Vivas Leon, was in Panama, and should according to precedent and law have succeeded to the presidency.

On the night of the 30th of March General Gonima sent Colonel Ulloa (then commanding the Boyaca) by train to Colon, with a portion of the troops in Panama, to put down Prestan's revolution. In order to prevent a conflict within the limits of Colon, Mr. Burt, the Superintendent of the Panama Railroad Company, notified Colonel Ulloa that he must disembark at Monkey Hill, about 2 miles outside of Colon. This was also made necessary by Prestan, who, hearing of the departure of national troops, went out with his force to meet Ulloa, tearing up the railroad tracks between Colon and Monkey Hill.

The two forces, numbering about 150 each, met on the Panama side of Monkey Hill. After a short conflict Prestan was driven from his position into Colon and behind his barricades in that city. After fighting for several hours on the morning of April 1, the insurgents were dislodged and put to flight by the national forces, led with great gallantry by Colonel Ulloa and his second in command, Colonel Broun, who was Chief of Police of Panama. Both officers were severely wounded in the engagement. During the conflict the city was fired by the insurgents and destroyed.

The departure of Colonel Ulloa and his command from Panama still further reduced the force in that city; and on the day of the fight in Colon, April 1, Aizpuru, with the ammunition taken on the 16th of the preceding month from a sealed car in transit to Central America, captured Panama. General Gonima, with less than 100 soldiers in the cuartel, made a gallant defense and held out for some time against a much larger force. He finally surrendered to Aizpuru to prevent the destruction of the cuartel by dynamite taken from contractors employed by the canal company and used for blasting.

When General Gonima surrendered the Boyaca was included in the stipulations, but Señor José Obaldia, who was in command of her, refused to be governed by the terms of the surrender and sailed for Buenaventura, then held by the National Government. General Aizpuru, having seized the government, declared himself President of the State of Panama, and filled the offices with his friends.

Colonel Ulloa, with less than 100 national troops, held Colon; the rest of the Isthmus included in the zone of transit was held by the insurgents under Aizpuru.

This was the condition of affairs upon the arrival of the naval force at Colon in the Pacific Mail Steamship Company's steamers City of Para and Acapulco, on the 11th and 15th of April.

On the morning of the 17th, accompanied by Lieutenants Cowles and Reeder, I passed over the line of railroad, inspecting the road and the garrisons at Matachin, San Pablo, and Panama, returning to Colon that evening.

Not deeming it necessary at that time to enter the city of Panama, I wrote a note to Mr. Adamson, our consul-general, asking him to visit me if perfectly convenient. The consul-general was kind enough to come to Camp Jouett, the name given to the position occupied by the naval force at the railroad station.

A few days prior to this General Aizpuru had borrowed a large steam tug from the canal company, in which he had sent two commissioners to Buenaventura for the purpose of coming to terms with the commander-in-chief of the national forces, which were assembling at that port to embark for Panama. The insurgent force in Panama was engaged in loop-holing the cathedral and the old monastery in the Plaza San Francisco, an indication that resistance would be made to the entry of the Nationals.

Although anarchy reigned along the line of railroad, I came to the conclusion that there would be little or no danger to the transit unless the *de facto* government of Panama, represented by Aizpuru, should be threatened or overthrown. This was not likely to occur until the arrival of a sufficient national force from the vicinity of Carthagena or Buenaventura. The danger then to be apprehended was the probability that during a conflict within the limits of Panama, the city would be fired by the insurgents, in whose ranks were some of Prestan's men who had taken part in the burning of Colon. The large sums of money paid semi-monthly to the employés of the canal company had attracted men of bad character from the West Indies and the West Coast. These men had nothing to lose, and the prospect of plunder was an incentive to fire Panama. The city was not supplied with water, and had no fire apparatus. In the prevailing strong winds the flames, in case of conflagration, would have spread to the buildings and wharves of the Panama Railroad Company and have destroyed them. Such a disaster would have prevented the transfer of freight for some months, and thus practically have closed the transit.

My chief anxiety was therefore that I should not be able to prevent the destruction of the city.

In consequence of the difficulty met with in discharging the stores from the Acapulco, on account of the burning of the wharves in Colon, it was not until Monday, the 20th, that we were able to place them in an accessible place, a large store-house which had been built in the mean time by the Panama Railroad Company opposite Post 3.

On that day I visited Matachin and San Pablo to investigate a reported attempt to blow up the house occupied by the force at the latter station. A Spanish negro had been seen hanging about within the lines at San Pablo late in the afternoon of the 19th instant. Shortly afterwards Lieutenant Elliott was informed that a man in the neighboring camp occupied by the canal employés had threatened to blow up the garrison. Lieutenant Elliott promptly caused the arrest of the man, who had in his possession a package of dynamite with fuse. He proved to be the man who had been seen within the lines a short time previous, and his clothes were found under the barracks. The man was sent to Colon and placed in confinement. He was afterwards turned over to the Colombian authorities.

On the following morning I transferred the headquarters from Colon to Panama.

On the same day Admiral Jouett inspected the several garrisons, returning to Colon the same afternoon.

At this time it was reported that the Commanding Officer of the National Forces at Buenaventura had declined to treat with the two commissioners sent by Aizpuru, and had seized the tug in which they were sent from Panama. It afterwards turned out that the Commissioners had been offered the option of returning to Panama with the National Forces or of remaining in the State of Cauca. They preferred the latter alternative.

It was also reported that the national troops at Buenaventura were being embarked in the iron steamer Guayaquil (from which the engines and boilers had been removed), belonging to the Pacific Steam Navigation Company, and used by them as a hulk to store freight. On that day Captain Higbee was directed to order Companies B and D, under the command of Captain Collum, to proceed to Panama by the 3 o'clock train. After the arrival of these companies, they, together with a gatling from the Alliance, and a howitzer from the Swatara, all under the command of Captain Collum, were quartered at night in cars at the new passenger station, extending our lines to the bridge crossing the railroad.

On the afternoon of the 21st, accompanied by Lieutenent Cowles and Mr. Icaza, I drove over the town for the purpose of acquainting myself with the condition of the city.

On the 22d instructions were issued to the garrison at Camp Jouett, a copy of which is appended and marked H. The dispositions required by that order were made on the evening of the same day, and again on the afternoon of the 23d for practice.

On the 23d I received information that 700 national troops had embarked in the Boyaca, the hulk Guayaquil, and a schooner; later I was notified that this force had sailed, the Boyaca and canal tug towing the hulk and schooner and three whale-boats in which to land the men at Panama.

## THE OCCUPATION OF PANAMA.

[See plan marked I.]

On the 24th it was reported that barricades were being erected in the streets, an indication that General Aizpuru would resist the national forces and that fighting in the streets would follow. At 11.55 a. m. our consul-general called on me and notified me that two barricades were being erected at the points marked T on the plan, and that in consequence communication would be cut off with the Central and South American cable office, marked U.

I notified the consul that I would occupy the city in half an hour, but the occupation was put off until 1 o'clock in order that the men might have their dinner comfortably.

Rear-Admiral Jouett was notified by telegraph of my intention to occupy Panama. The signal agreed upon with Captain Norton to land all the available force from his ship was made, and the following telegrams were sent to Lieutenant Allibone and to Rear-Admiral Jouett:

PANAMA, *April* 24—12.30 p. m.

Lieutenant ALLIBONE,
*Special Aid, Colon :*

Direct Captain Higbee to send the entire force now at Colon, with all the guns, to Panama, using the utmost dispatch. A special train will be furnished by Mr. Burt.

McCALLA.

PANAMA, *April* 24—3.40 p. m.

Admiral JOUETT, *Colon:*

Send the reserve battalion of marines to Panama by special.

McCALLA.

At 1 o'clock the disposition of the force for an entry into Panama was completed, and as soon as the boats from the Shenandoah were in sight the signal was given to advance.

Tanks of powder and a Farmer's dynamo machine, with wire and fuzes, had been obtained from the Shenandoah to be used if necessary to blow up buildings.

The several columns advanced without music, the marines in two lines deployed for street firing, the gatlings and field guns between the lines of marines. Each man carried 80 rounds of ammunition, canteen, and rubber blanket. The marines carried 40 rounds in haversacks.

The instructions contained in my letter of the 22d were carried out, except that they were so far modified that the entire center column marched to the cable office, and that the force commanded by Captain Collum marched directly to the Plaza Santa Ana by the Chemin de la Savane and the Carrera del Isthme; Captain Reid's company and the gatling from the Alliance being left to occupy the junction of the Chemin de la Savane with the road leading to the hospital. That portion of the order directing the left column to advance by the beach, if the tide permitted, had been rescinded on the 23d.

The barricade in the Carrera de Caldas was made of heavy wooden posts set in the ground 3 feet apart, connected by boarding to be backed with earth. The barricade in the Carrera de Ricuarte, near the principal cuartel, was constructed of sand bags. The former was torn down. The latter was occupied and a Gatling mounted behind it, trained on the cuartel.

Having heard that General Aizpuru would be at the Panama Railroad depot during the afternoon, I gave orders that he should be held in case he came.

The force was now disposed as follows:

Company C, of the First Battalion was at the Cable Company's office; Company E of the First Battalion, a short Gatling, and 20 men under Ensign H. M. Witzel, were at the sand-bag barricade in the Carrera de Ricuarte; Company B, First Battalion, was stationed at the consulate; company A, First Battalion, was stationed at the Pacific Mail Company's office; Lieutenant Hughes, U. S. N., with 20 blue-jackets and a short Gatling, were stationed at the junction of the Carrera de Sucre and the Cathedral Plaza. Ensign Jas. H. Oliver, U. S. N., with 20 blue-jackets and a 3-inch. B. L. R. were stationed at the junction of the Carrera de Sucre and the Carrera de Cordova. Captain Collum occupied the Plaza Santa Ana, the most important position in the city, with company A, Second Battalion, Company D, First Battalion, and 40 blue-jackets with two pieces of artillery. Junior Lieut. F. E. Sawyer and Naval Cadet I. K. Seymour, U. S. N., were in charge of the latter.

A line of sentries was posted from the Plaza Santa Ana along the Carrera Chiriqui to the bay, and another along the Carrera de Bocas

Toro to the Sea, the former connecting with a line running parallel with the bay to Camp Jonett.

At Camp Jouett there were 33 blue-jackets under Lieut. Lucien Young, U. S. N.

General Rafael Aizpuru and other revolutionary officials, namely, Senor Carlos Vallarino, Secretary of War; Carlos Mendoza, Secretary of State, and Bernardo Vallarino, Governor of Panama, were arrested near the Consulate of the United States. By request of Mr. Adamson they were taken to the consulate for a time, on account of the temporary indisposition of General Aizpuru.

I explained in brief to General Aizpuru that I had no desire to interfere with the existing government, but that the barricades in the streets cut off my communication with the Central and South American Telegraph Company's office, and that the street fighting which would inevitably ensue threatened the lives and property of American citizens, which I had been instructed to protect. I also stated that I should be compelled to detain General Aizpuru until a definite assurance was given me that the lives of Americans should not be endangered, nor their property injured or destroyed. He was given the option of going either to his headquarters or to the hotel, under guard.

General Aizpuru stated that he would give up the city; I replied that I would be happy to assume the responsibility of its protection, and through the kindness of the proprietors of the Panama Star and Herald published the following notice, with translations in Spanish and French:

NOTICE TO THE PUBLIC.

Having been informed by the Consul-General of the United States that a military force was erecting barricades which would cut off communication with the American Cable Company, I have entered the city peacefully, in order to take measures to prevent injury to American interests. All law abiding citizens will be protected. All saloons and liquor shops must be closed. The city will be policed by the force under my command, and no one will be permitted to enter the city by land or sea.

B. H. McCALLA,
*Commanding the U. S. Naval Forces on the Isthmus of Panama.*

MAY 24, 1885.

Later, by the invitation of Mr. Shuber, the owner of the Grand Central Hotel, General Aizpuru and his friends decided to go there, accompanied by Lieutenant Reeder, in whose custody they were placed. A platoon from Company A of the First Battalion was detailed to guard the hotel.

A subterranean passage at one time led from the old monastery in the Plaza San Francisco to the cathedral. The Plaza Santa Ana was the center of the part of the city occupied by the worst classes. It therefore became necessary to occupy the church in the Plaza Santa Ana and the Cathedral, the keys of which were cheerfully turned over by the priests in charge. Care was taken that no injury was done to the churches.

Lieut. L. Young on his arrival from the Shenandoah relieved the force of Lieutenant Berryman, U. S. M. C., at the depot. The latter at once marched his command to the Plaza Santa Ana. Later in the afternoon Lieutenant Mason, U. S. N., was placed in command at Camp Jouett.

The garrison from Colon, consisting of Companies C and E, Second Battalion, two sections of Gatling and two sections of rifled guns, under command of Lieutenant Allibone, arrived about 5 p. m. Before sunset a strong picket-line was thrown across the peninsula on which the city was built, extending from Camp Jouett to the shore on the south, and shown on the plan marked I. This line was occupied by Companies D and E of the Second Battalion, Captains Reid and Harrington, three Gatlings under Lieutenant Badger, Naval Cadet Plunkett, and Gunner Walsh, the whole force under command of Lieutenant Allibone.

Company C, Second Battalion, Captain Muse, reinforced Lieutenant-Colonel Heywood's column, and was quartered in the office of the Pacific Mail Steamship Company. The second platoon of Company A, Captain Meeker, was sent to Shuber's Hotel.

About 7 p. m. there was a quarrel between some citizens in the Cathedral Square, during which several shots were exchanged. The Gatling gun in the Calle Sucre, sufficiently elevated to clear the tops of the houses, was fired across the plaza, clearing it in a few seconds. No further disturbance occurred during the night, the city being thoroughly patrolled under the direction of Brevet Lieutenant-Colonel Heywood.

The marines of the vessels of the North Atlantic Station, anchored off Colon, had been organized by order of Rear-Admiral Jouett into a reserve battalion. This battalion, about 100 strong, under command of Captain Young, U. S. M. C., arrived at Panama about 10 p. m., and was quartered for the night in the railroad station. On the 25th the companies of the reserve battalion relieved the companies at the barricade and the cable office.

The military force of Aizpuru was said to be from 600 to 800 men; but from information furnished me I estimated it to be about 500, distributed in the cuartels or barracks marked J, K, L, S, on the plan of Panama.

On the following day, while I was at the Consulate, the Commanding Officer of the insurgent troops came there and asked if the naval force would be withdrawn to Camp Jouett provided that a guarantee were given that no barricades should be erected, and that no street fighting should be permitted. An affirmative reply was made, and at the request of the officer I saw General Aizpuru.

In anticipation, however, of a possible attack that night, instructions had been given Lieutenant Allibone to break camp and enter the city at 5.30, to leave Company D, Second Battalion, and the Gatling from the Alliance, at the Plaza Santa Ana, and to march with the rest of his force to the Cathedral Square.

To cut off communication with the principal cuartel, which had purposely been left open the previous day and night, the force in the Calle Sucre was moved into the Carrera Narino, the barricade of sand bags was moved one block to the westward, and the 12-pounder howitzer was moved to the junction of the Carreras de Caldas and de Acevedo Gomez. The rest of the force in the vicinity of the cathedral square was so disposed as to hold the parallelogram embraced generally by the bay on two sides, the Carrera de Camillo Torres, and Carrera Narino.

Upon visiting General Aizpuru, in compliance with his request, he offered to give the guarantee before mentioned. In order that there should be no misunderstanding I obtained the services of Mr. Del Valle and Mr. Millet, American citizens who were familiar with the Spanish language, and who kindly consented to act as interpreters. The following agreement was made out in Spanish and in English:

> The undersigned, Rafael Aizpuru, president of the sovereign State of Panama, and B. H. McCalla, commanding the United States naval forces on the Isthmus of Panama, have agreed to the following, viz:
>
> ARTICLE I. Once this agreement signed, Commander McCalla will withdraw the American troops at present occupying the city of Panama to the quarters which they occupied up to yesterday, in the neighborhood of the Panama Railroad station.
>
> ART. II. General Aizpuru binds himself to fulfil the duty of thoroughly protecting the lives and interests of the American citizens and foreigners residing in the city of Panama; he will not allow any fighing to take place within the limits of the city, nor will he allow barricades to be erected.
>
> ART. III. Commander McCalla will take no part in any political contest.
>
> Signed in duplicate in the city of Panama, April 25, 1885.
>
> R. AIZPURU.
> B. H. McCALLA, U. S. N.
>
> True copy of the paper in English held by General Aizpuru,.
>
> NOTE.—A copy of the agreement in Spanish is appended, marked J.

In accordance with the agreement, the naval force was withdrawn from the city about 8 p. m., except portions which remained, by request of General Aizpuru, at the Consulate and in the Plaza Santa Ana until 9 o'clock.

Some dissatisfaction was expressed at the withdrawal to the railroad depot of the naval force, and some fear least Aizpuru would be unable to afford protection to Americans, but the object of the occupation of the city having been satisfactorily attained there was no good reason for remaining there any longer. As it turned out these apprehensions were groundless.

A cablegram received from the Navy Department late on the afternoon of the 25th, left me discretion so far as holding the town was concerned.

It happened that our position at the railroad depot was the best one strategically that could have been selected. From the new passenger station all roads leading from the city could be occupied in a very short time.

During the occupation of the city the men behaved in the most exemplary manner, and though they were always prepared for an attack, and the seamen were armed with either the Hotchkiss or Lee magazine guns, no accident occurred. To express to some extent my appreciation of their behavior, the next day at inspection the following order was published:

Order.] HEADQUARTERS UNITED STATES NAVAL FORCE
ON ISTHMUS OF PANAMA, *April* 26, 1885.

The Commanding Officer desires to express to his command his appreciation of their excellent conduct under the trying circumstances of the last two days.

No higher praise can be given than that which is conveyed in the notification that there was not an accidental discharge of any weapon.

The command will be held in readiness to move at any moment, and I desire to caution it against opening fire too soon.

Our only purpose is to protect the lives and property of Americans and to keep the transit open.

B. H. McCALLA.
*Commander, Commanding.*

On Sunday, the 26th, there was a fight between Jamaicans and Colombians at Paraiso Station, 7½ miles from Panama. Exaggerated reports of this disturbance reached Panama, and on Monday morning, the 27th, the British Consul called on me to report that 13 Jamaicans had been shot the preceding day at Paraiso, and that the calaboose was full of wounded men. The railroad officials also reported that the stationhouse at Paraiso had been fired into the previous night, and that the workmen were in fear of their lives.

Obtaining permission from Rear-Admiral Jouett to send a force to that place, Captain Reid, U. S. M. C., was sent to Paraiso the same day with his company. Assistant Surgeon Ogden, U. S. N., was ordered to report to Captain Reid and in addition to the instructions of the latter, appended, marked K, he was directed to offer the services of Assistant Surgeon Ogden to the Alcalde of Paraiso in case there were wounded men needing treatment in the calaboose. None of the latter were in need of a surgeon, and reports of the affair were found to have been grossly exaggerated. Three Jamaicans were killed in a race quarrel which was brought about by drinking. Indeed, nearly all the fatal quarrels occur on Sunday, and the origin may generally be traced to liquor. On Tuesday Lieutenant Mason, with one section of artillery in an armored car, relieved Captain Reid, the latter returning to Panama with his company.

On Monday evening, the 27th, after the departure of the garrison for Paraiso, the landing party from the Iroquois (which had arrived off Panama the day before) came ashore, and was quartered for the night on the railroad wharf. Early Tuesday morning the Boyaca, with the canal tug, hulk Guayaquil, schooner, and three whale boats were seen in the bay.

Lieutenant Reeder was sent to call on the Commander-in-Chief to present my compliments, and to explain, if necessary, more fully the request contained in the following communication:

HEADQUARTERS UNITED STATES NAVAL FORCE
ON ISTHMUS OF PANAMA, *Panama, April* 28, 1885.

SIR: I have the distinguished honor, in the absence of my Commander-in-Chief, Admiral Jouett, at Colon, to inform you that for the protection of the transit across the Isthmus, and for the protection of Americans and their property, I occupy the railroad station at this place with a United States naval force.

My lines, for this purpose, necessarily extend from the railroad wharves to the passenger station at the bridge.

May I beg leave to request that the National Force under your command may be directed not to land within my lines.

I shall take the first opportunity of paying my respects to you; meanwhile I shall be most happy to place my personal services at your disposition.

I have the honor to be, very respectfully,

B. H. McCALLA,
*Commander U. S. N., Commanding.*

To the COMMANDER-IN-CHIEF COLOMBIAN NATIONAL FORCES OFF PANAMA.

Colonel Montoya, who had been appointed Military and Civil Chief of the State of Panama, was on board the Boyaca, as well as Colonel Reyes, the Commander-in-Chief of the military force, which consisted of about 600 men. During the conversation Colonel Reyes stated to Lieutenant Reeder that he was having the entrance to the Rio Grande, south of the city, examined with the view of finding out whether he would be able to land his forces in that vicinity.

Rear-Admiral Jouett having come to Panama on the afternoon of Tuesday the 28th, on Wednesday Colonels Reyes and Montoya and Aizpuru met in the railroad office, Rear-Admiral Jouett taking part in the conference. The conference resulted in an agreement being signed between the representatives of the Colombian Government and Aizpuru by which the latter was to surrender.

The quasi government represented by Aizpuru having entirely disappeared with the signing of the capitulation, the reasons which had hitherto made it imperative to prevent the landing of the Colombian forces within our lines now ceased to exist. They accordingly landed at the railroad wharf early on the morning of the 30th, and we were able to facilitate their disembarkation. By the terms of this agreement the national troops marched into the city from their camp in the savannah, to the north of the lines occupied by us, at 1 p. m. on Thursday the 30th; a battalion under Captain Collum, made up of two companies of the Second Battalion of Marines, one Gatling section, and one B. L. R. section, were drawn up on the road in front of the new passenger station, and presented arms as the Colombian force under Colonel Reyes marched past. The latter halted his command and returned the salute. On the arrival of Colonel Reyes at the presidency, the Colombian flag was hoisted in Camp Jouett, and a national salute fired from the field pieces in front of our headquarters. This salute was returned on the following morning.

On the 30th the forces from the Shenandoah, Swatara, and Alliance returned to their ships.

On Friday, May 1, the four companies of the Second Battalion of Marines, two sections of the B. L. R. Battalion, and the Gatling Battalion returned to Colon, Lieutenant Allibone relieving Lieutenant Colahan of the command of the force at that place.

On Friday morning with Lieutenant Cowles, accompanied by Mr. Adamson, I called upon Colonels Montoya and Reyes. I had the pleasure of congratulating them upon their promotion to the rank of General, information to that effect having been received from Bogota. In this connection I desire to state that in my opinion the people of the Isthmus are to be congratulated upon having in authority two such able, energetic, and accomplished men as Generals Montoya and Reyes. Without the determination shown by these men the suppression of the rebellion must have been postponed and our stay on the Isthmus lengthened.

Before the arrival of the national troops from Cauca there had been much talk among those who sympathized with Aizpuru in regard to the ferocity and brutality of the expected Colombian forces. I am glad to state here that I saw them all land, and failed to detect among them any man who had the appearance of deserving such a reputation.

I returned to Colon on May 1, inspecting the garrisons at Matachin and San Pablo on the way. The same day the garrison at Paraiso returned to Colon.

On May 5, in consequence of the failure of the insurgents to deliver up their arms as agreed upon, General Aizpuru and his principal adherents were arrested and confined by order of General Reyes.

In consequence of the unsettled condition of the Isthmus, General Reyes found it necessary to issue the following proclamation:

> *The Commander-in-Chief of the Colombian Forces to the Inhabitants of the Isthmus of Panama:*
>
> In order to more effectually punish the numerous criminals who have disturbed the peace of the Isthmus, and who still persist in their outrageous crimes, I have declared martial law in this State as the best means to secure order for the present.
>
> All persons are earnestly requested to remain at their homes and continue their customary occupations so that further disorder may be avoided.
>
> I shall protect all peaceable and well disposed persons to the utmost extent of my power.
>
> RAFAEL REYES,
> *General, Commander-in-Chief of the National Forces.*
>
> COLON, *May* 5, 1885.

On the 5th of May a stand of colors was presented to the Second Battalion of Marines, and guide flags to the Gatling and 3-inch B. L. R. Battalions. (The First Battalion had been supplied.)

On the 7th of May portions of the First Battalion of Marines were sent to San Pablo and Colon, and that night the remainder of the force under my command sailed for New York on the Pacific Mail steamship Colon. The Colon arrived the morning of the 16th of May, and in compliance with the instructions of the Department, the men were transferred to the Brooklyn navy-yard and the officers were ordered to resume the duties in which they were engaged prior to sailing for the Isthmus.

It is proper to state that Lieutenant-Commander Longnecker, U. S. N., with a landing party of 125 blue-jackets and marines from the United States steamer Shenandoah held the Panama Railroad station (Camp Jouett) from the 7th of April until the arrival of Lieutenant-Colonel Heywood, U. S. M. C., with the naval force under his command, on the 11th of April.

I take this opportunity of presenting certain conclusions as the result of my observations upon the Isthmus.

### MARINES.

While the Marine Corps is highly efficient and admirably disciplined, their tactics are of a by-gone day. "Heavy Infantry" disappeared with the introduction of the long-range breech-loader. Unless officers and men are instructed in the principles of modern tactics and are taught to avail themselves of cover in advancing to an attack, they will only discover its advantages by fatal experience, as was the case with the Russian infantry during the last Russo-Turkish war.

The method of developing a modern fighting line advocated by the late General Upton in his book under the head of "deploying as skirmishers by numbers," is well adapted for the purpose, but it requires additional rules for deployment when in column. The manual for the rifle is also obsolete. "Carry Arms" should be abolished, and the different movements in the manual of arms should be executed from an "Order," in which position the piece should habitually be when at a halt. The above applies with equal force to the instruction of blue-jackets.

All Marine Officers should pass through the Torpedo School at Newport, R. I., and there should be one or more always stationed at the Artillery School at Fort Monroe.

The men should be instructed in practical electricity as applied to the use of land and submarine mines.

Much of the time now wasted in barracks could be profitably employed in drilling with machine guns and field pieces, which could be borrowed from the Ordnance Bureau. Every summer the marines in the United States should go into camp, half of those stationed at each naval station marching to a common center for that purpose. In midsummer they could be relieved by those who had remained on duty at the stations. The officers should sleep and mess in the camp. I am quite sure that Army officers would welcome an addition of this kind to the force of the Army which annually encamps in the vicinity of Washington.

The officers of the Marine Corps suffer, as do naval officers, from the want of a healthy flow of promotion, and from the absence of all stimulus to mental activity caused by the present system of advancement.

It may be well to state here that blue-jackets and marines performed outpost and sentry duty equally well.

### LANDING PARTIES.

It has frequently been necessary in the past, and it will continue to be necessary in the future, to land a force of seaman and marines from all of our squadrons. The landing party from each ship, as well as the naval brigade of each squadron, should therefore be landed at least once a week for practice. There has been too much objection to such exercises on the part of naval officers, but the need of them must now be apparent to the most conservative. The necessity for such practice is now thoroughly recognized by the officers of other naval powers. Dress parades should be abolished, and only those manœuvres likely to be of use in actual service should be practiced.

I should recommend the adoption of some form of shield for use with the gatling gun and the 3-inch B. L. R.

The landing party which came on shore from the Iroquois under command of Lieutenant-Commander Stockton, U. S. N., showed evidence of having been carefully organized and frequently drilled.

### ARMS, EQUIPMENT, AND CLOTHING.

The marines were armed with the Springfield rifle, the blue-jackets, (except the 8 cannoneers of each gatling and field piece, who carried revolvers and cutlasses) with the Lee magazine rifle.

More or less complaint was made of injury to the firing pins of the Springfield, and two accidental discharges occurred in my presence, caused by the shock due to the hammer at half cock striking the left fore-arm when shifting the piece from the "right shoulder," to "support arms." The Lee magazine rifles gave us no trouble, none of them having been disabled during the time they were in service. The model of this rifle had the disadvantage of being about 3 or 4 inches shorter than the rifle adopted by all nations for their infantry, and it was fitted with an inferior rear sight. Fortunately there was no fighting, and our force did not, in this instance, suffer from the reduced range and want of accuracy due to the shortness of barrel. The hands of the men, however, were frequently cut by the sharp edges of the rear sights. There seems to be no good reason why our seamen should not be armed with rifles equal in length of range and in sights to the most accurate supplied to the infantry of other governments.

The blue-jackets had grey webbing belts which fastened in front, and contained pouches for two rows of cartridges (eighty in all), the weight being transferred to the shoulders by means of cross straps; the marines had white leather belts and two cartridge boxes containing twenty cartridges each. The former answered admirably; the latter had the disadvantages of offering a good target to the enemy, of having no shoulder support, of adding materially to the discomfort and fatigue of the men wearing them, and of not carrying sufficient cartridges. They should be abolished at once. I should recommend that each seaman and marine be supplied with brown or tan-colored webbing belts, one about the waist containg forty cartridges, with shoulder supports, the other containing the same number of cartridges, to be worn over the right shoulder and under the left arm. The most convenient place to carry cartridges is in front of the center of the body. The space required for the clasps of belts is necessarily without cartridges. Therefore it would facilitate rapid firing if the waist belt were clasped on the side under the left arm.

. In consequence of the long-range rifles now in use it becomes important to select neutral colors for uniform. White offers an excellent target. Some other colors should therefore be adopted for the helmets of the marines and the leggings of seamen. This necessity was impressed upon all the officers who were in Panama during the night of occupation. To those who advocate white on the score of effect, it is only necessary to say that the most serviceable uniform is always the most effective.

The helmets of the marines are much too heavy; those for naval officers, although much lighter, could also be reduced in weight. The fatigue cap for both officers and enlisted men of the Marine Corps is in every way unserviceable, and should be changed for one which has greater air space and better protection for the eyes. Without the straw hats purchased by direction of the Department, and issued to the bluejackets, the latter would have been very uncomfortable, and would probably have suffered severely from the effects of the sun. Marines on ship-board should always be provided with leggings, because from the character of the service they are likely to perform when forming part of a landing party, the leggings are as indispensable to them as to seamen.

## AMMUNITION.

A large supply of serviceable rifle and revolver ammunition should be kept in readiness for instant service. When the Navy is called upon for an armed force the force is required in a hurry. The First Battalion of marines, about 225 strong, sailed from New York the day after the order was given to organize it. But 20,000 rounds of serviceable ammunition could be supplied to it, consequently 40,000 rounds of cartridges marked "unserviceable" were added to bring the amount up to 60,000 rounds.

With the entire force of 650 men and 3 gatlings, but 100,000 rounds of "serviceable" ammunition were supplied, an amount in my opinion much too small considering the distance of the Isthmus from the base of supplies, and the enormous consumption of cartridges by breech loaders, magazine and machine guns. The expedition should have been supplied with at least 300,000 rounds.

Of the pistol ammunition landed from the Swatara for the use of her men 75 per cent. was found to be too large for the pistols, and prevented the breech-blocks from closing.

The haversacks were not quite large enough to carry two days' provisions. The inside of the haversack might be fitted with small compartments or canvas pouches for tea, coffee, sugar, and salt. They, together with the canteens and blanket bags, should be numbered consecutively, in order that they may be recognized by their owners. Without numbers they are likely to be disfigured by marks or names.

The canteens were made from the ordinary tin of commerce and rusted badly in use. It will be advisable to consider the question of substituting some kind of natural or prepared wood for the tin.

### INDIA-RUBBER BLANKETS.

The india-rubber blankets obtained from the army and taken to the Isthmus in the Acapulco were found most serviceable. Each non-commissioned officer, petty officer, and enlisted man carried one. They were also issued to such of the officers as were not provided with waterproof clothing.

### PROVISIONS.

The provisions were excellent in quality and ample in variety; the only exception in quality being the tea, which had deteriorated by age.

Lieutenant Allibon reported that the pressed corned beef was excellent, but when served out and eaten cold, as was sometimes necessary, it produced indigestion; causing vomiting in a number of cases.

The men having their canteens filled with water drank immoderately, which probably caused the sickness mentioned. If the corned beef were cooked with potatoes, or with rice and biscuit in the shape of a stew, it would make a palatable dish.

All articles were put up in large packages. In issuing rations to the different detachments this arrangement was found very inconvenient. A barrel of beans, pork, beef, &c., served out to a small number of men caused much waste under the circumstances incident to the service. On each ship in commission, articles forming part of the Navy ration should be put up in smaller packages and kept ready for issue to the "landing party."

During our service on the Isthmus it was often necessary to move detachments without warning, and the want was felt of a supply of some form of compressed food from which, by the simple addition of boiling water, each man could have quickly made a nourishing soup.

### WATER.

There is no distilling apparatus on the line of railroad. In the absence of distillers at the Brooklyn Navy-yard ready for shipment, a small boiler, pump, pipe, &c., were supplied by the Engineer Department to boil drinking water, if necessary.

Distilled water for drinking and cooking was supplied to the Naval Force in breakers from the ships at Colon and Panama.

The water at Frijoles, where there is a pumping station for the railroad, was tested and pronounced fit to drink, but an inspection of the source of supply was not reassuring.

From Taboga Island, Bay of Panama, excellent water can be obtained; but at the end of the dry season the supply is always very low.

### HEALTH.

There were the usual cases of fever and other diseases to be expected on the Isthmus and one fatal case of yellow fever, thought to exposure on the night of the occupation of Panama; but the general health of the command was excellent; greatly due, in my opinion, to the comfortable quarters generously provided by Mr. Burt, the superintendent of the Panama Railroad Company, and to the efforts of the officers to protect the men from the sun and rain. It was a matter of interest and surprise that the blue-jackets suffered much less from climatic influences than the marines, although both performed precisely the same duties.

At Matachin and San Pablo there was practically no sick list. Although the elevation of this section of the Isthmus may have had much to do with the good sanitary condition of the garrisons, the excellent regulations established by the commanding officer largely contributed to this result.

### CASUALTIES.

Private Marine David Irvine, Company E, First Battalion, was shot on the night of the 28th of April, while attempting to enter our lines, having been outside without authority. Thomas Brennan, Coal Heaver, attached to the Alliance, was shot on the morning of April 29 by Private Murray, Company E, First Battalion, during a quarrel. Both wounds proved fatal. Angus Flemming, Seaman Apprentice, from the Alliance, died of yellow fever on the 30th of April, in the French hospital at Panama.

### MEDICAL SUPPLIES.

I desire to call attention to the medical supplies sent out with the First Battalion of Marines, in the City of Para. Although ample supplies were afterwards sent, those furnished the above-mentioned force were entirely inadequate to the purpose intended; consequently such medicines as were needed had to be bought at comparatively great cost in Panama.

I was informed that upon application being made for medical stores such as were likely to be required on the Isthmus, the Medical Officer who had charge of these supplies stated that the expedition would require but few medicines since it was only meant for a demonstration and would return immediately. Such a remark, if made, would show that the necessity of making an expedition complete in all its details in order to insure its success was not understood nor appreciated.

Soon after our arrival at Colon, knowing by experience the necessity of having a full medical staff, I applied by cable for one additional surgeon and one apothecary. The application was not, however, granted. As it happened, Dr. Whiting had been taken down with the fever two days after the arrival of the Acapulco at Colon, and the only apothecary attached to the force proved inefficient and was of no assistance. The expedition was therefore subjected to great inconvenience, which might have had very serious results, and the officers to considerable anxiety, from the absence of the necessary medical attendance. If a Commanding Officer is to be held responsible for the success of an expedition it is imperative that a reasonable request of this nature should be promptly granted.

In this connection I may mention that on the passage from New York Dr. Whiting gave me a copy of a paper, entitled "Notes" or "Suggestions on Sanitary Precautions," signed by the Surgeon-General of the Navy and approved by the Secretary of the Navy. They were not addressed, but were given to Dr. Whiting by the Senior Medical Officer stationed at the Brooklyn Navy-Yard. Although brought to the attention of the Commanding Officer in this somewhat informal manner, they were regarded as an order of the Department, and were enforced during the service on the Isthmus. The Commanding Officer of each garrison was supplied with a copy, and they were afterwards promulgated by the Commander-in-Chief in a Squadron General Order. The suggestions were found to be valuable in practice.

It was found before leaving New York that a portion of the ordnance supplies for blue-jackets was about to be shipped on board the City of Para, in compliance with the directions of the Bureau of Ordnance. As the execution of this order would have precluded the possibility of giving the seamen embarked on board the Acapulco the necessary instruction in the use of their arms during the voyage down, arrangements were made to take the equipments in the latter vessel.

The points referred to above illustrate the necessity for a central office in the Navy Department, the chief of which, having received a military education and being thoroughly cognizant of the intentions and desires of the Secretary, should be held responsible for the technical details necessary to fit out an expedition or ship in the most efficient manner. He should be aware of the contents of all instructions sent by officials relating to the fitting out of the force. Under the present system the Chiefs of half a dozen Bureaus may overwhelm the Commanding officer of an expedition or the Commandant of a Station with confusing telegrams, thereby causing delay or possible failure.

This suggestion is not meant to reflect upon the Bureau system, but is intended to call attention to the need of a central office in the Navy Department, by which unity of action may be secured and all confusion of the kind referred to be avoided in future expeditions.

## TRANSPORTS.

The larger and better organized the force which a naval squadron can throw on shore quickly the more formidable that squadron becomes. This has always been the case! It seems probable that in future naval operations an additional number of seamen and marines, organized in naval brigades, will be carried in transports accompanying the battle ships.

In common with other maritime nations, the United States should own naval transports. One would have been of great use upon this occasion, and, in addition, would have answered as a hospital ship and movable base. During peace transports could be used to transport our own men or to transfer detachments of the Army from post to post on the sea-board. The experience gained in embarking and disembarking troops would be valuable to both branches of the service.

## PANAMA RAILROAD COMPANY.

The Panama Railroad, under the able management of Mr. G. A. Burt, the present General Superintendent, has been vastly improved since my last visit to the Isthmus, three years ago. The rolling stock (a large part of which was destroyed when Colon was burned) was in excellent condition; the road bed was well ballasted, the embankments were in good order, and the trains ran on schedule time. It was not uncommon to run a locomotive and one car over the 47½ miles between Colon and Panama in one hour and eighteen or nineteen minutes, although there are 10½ miles of curves in that distance. Upon one occasion I was carried in a "special" 11 miles in thirteen and one-half minutes.

The few clusters of native huts which marked the stations before the advent of the canal company had grown into an almost continuous line of thriving villages. The passenger traffic has grown enormously, increasing from 26,801 in 1880 to 515,520 in 1884, nearly all of it local. Six of the daily trains, three each way, were for passengers. The gross earnings of the road for the year 1884 were $3,494,776.

I take great pleasure in stating that Mr. Burt did everything in his power to make officers and men comfortable in buildings owned by the company, and that he was always ready to transport our forces at a moment's notice. Mr. Ernesto Icaza, the agent of the Panama Railroad at Panama, often rendered us valuable service at considerable peril and inconvenience to himself.

Appended, marked L, is a map and profile of the railroad.

## PERSONNEL.

While all the officers did well, I feel it my duty to call the attention of the Department to those who came under my immediate observation.

* * * * * * *

The conduct and efficiency of the noncommissioned and petty officers are worthy of the highest praise. The behavior of the enlisted men was admirable; less than 3 per cent. were found to be unreliable on duty or in camp. When the peculiar temptations to which they were subjected in the trying climate of the Isthmus are considered, this fact is highly creditable to them.

A statement of the force employed during the occupation of Panama is appended, marked O, together with a copy of Squadron General Order No. 19, marked P.

In conclusion I desire to state that I consider it a great honor to have commanded so fine a body of officers and men.

Very respectfully your obedient servant,

B. H. McCALLA,
*Commander, United States Navy.*

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B.

*Daily routine, Pacific Mail steamship Acapulco.*

| | A. M. |
|---|---|
| Reveille | 5. 45 |
| Wash clothes | 6. 00 |
| Breakfast | 7. 00 |
| Sick call | 9. 00 |
| Quarters | 9. 30 |
| Recall from drill | 10. 30 |
| Music practice | 10. 45<br>11. 30 |
| | P. M. |
| Drill call | 2. 30 |
| Recall from drill | 3. 30 |
| Supper | 4. 30 |
| Sick call | 5. 00 |
| Tattoo | 9. 00 |
| Taps | 9. 10 |

A marine officer of the guard and a naval officer were on duty day and night.

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C.

NORTH ATLANTIC STATION,
U. S. FLAGSHIP TENNESSEE (1st rate),
*Aspinwall, U. S. C., April* 15, 1885.

SIR: By direction of the Navy Department you will please assume command of the forces which have been sent from New York by steamer for the protection of American interests on the Isthmus of Panama. You will also include in your command all the forces which have been landed from the North Atlantic squadron.

You will land the men now on board the Acapulco at your own discretion, as soon as they can be properly accommodated on shore.

The transit is open and trains have been running regularly since the 11th instant. Aspinwall is held by the Colombian troops, and Panama is in the hands of the insurgents.

I inclose for your information a memorandum showing the number and disposition of the forces on shore; also, copies of a squadron general order relative to sanitary precautions to be observed, and of my orders to Lieutenant Colahan and Colonel Heywood.

Very respectfully,

JAS. E. JOUETT,
*Rear-Admiral, Commanding U. S. Naval Force on North Atlantic Station.*

Commander B. H. McCALLA, *U. S. Navy,*
*Pacific Mail Steamer Acapulco, Aspinwall, U. S. C.*

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U. S. FLAGSHIP TENNESSEE (1st rate),
*Aspinwall, U. S. C., April* 11, 1885.

SIR: Proceed to Panama with the battalion of marines under your command, for the protection of American lives and property in that vicinity. The details of this service are left to your discretion.

Panama is now in the hands of the revolutionary forces, and it is feared that if the place is attacked by the regular Colombian troops these revolutionists will attempt to destroy the city, or portions of it, by burning. As the burning of Panama would involve the destruction of much American and other foreign property, you will prevent it if possible.

Please advise Captain Norton, commanding United States Ship Shenandoah, now at Panama, of your arrival there.

I inclose herewith a copy of my telegraphic instructions from the Department, and also some extracts of a sworn protest by Mr. George A. Burt, general superintendent of the Panama Railroad Company, for your information.

I have detailed a Gatling gun and a 12-pounder S. B. howitzer, with officers and crew, for service with your command.

The officers are directed to report to you.

Very respectfully,

JAS. E. JOUETT,
*Rear-Admiral, Commanding U. S. Naval Force on North Atlantic Station.*

Maj. CHARLES HEYWOOD,
*U. S. M. C., Commanding Marine Battalion, Isthmus of Panama.*

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U. S. FLAGSHIP TENNESSEE,
*Aspinwall, U. S. C., April* 11, 1885.

SIR: You will proceed on shore and assume command of the forces landed for the protection of life and property in Aspinwall, relieving Lieut. W. P. Elliott, U. S. N., and directing him to return to his ship.

I desire to guard the city of Aspinwall from further attack or injury, and to preserve the property that remains, especially that belonging to Americans.

You are authorized to dispose of the forces landed from the fleet at your discretion, in order to accomplish the above-named objects; then report to me.

Very respectfully,

JAS. E. JOUETT,
*Rear-Admiral, Commanding U. S. Naval Force on North Atlantic Station.*

Lieut. C. E. COLAHAN,
*U. S. N., United States Ship Tennessee.*

GENERAL ORDER }
No. 16. }

NORTH ATLANTIC STATION,
U. S. FLAGSHIP TENNESSEE (1st rate),
*Aspinwall, April* 16, 1885.

The following sanitary precautions will be observed by all serving on shore on the Isthmus of Panama or in the tropics:

### SANITARY PRECAUTIONS—PANAMA.

Prevalent diseases are malarial fevers, yellow fever, diarrhea, dysentery, sunstroke. The most common causes that lead to a depressed vital condition, and so render the individual exposed to the causes of disease, are want of food, fatigue, excessive moisture, and these apply with multiplied force to masses of men, to which is added the dangerous factor of overcrowding.

*Water supply.*—There is a distiller on the wharf at Aspinwall. If destroyed, have a regular water police to supply the camp with distilled water from the ships. No other water to be used for culinary or drinking purposes.

*Food.*—Meals at regular hours—warm. The guard on duty at night to have a cup of hot coffee with buiscuit before going on duty, and this to apply to all relief parties. On turning out to go as soon as convenient to breakfast, previous to any exposure. The cooking to be inspected, and the food also before cooking.

*Clothing.*—Have a dry suit for each man, a water-proof coat to be used only when on guard in the rain. The weight to be carried to be diminished as much as possible; every ounce weight added to the clothing or materials to be carried imposes extra work, and in just that degree is a minus quality so far as efficiency is concerned. Flannel belts to be worn covering the abdomen. The head-gear to be as light as possible.

*Air.*—Avoid overcrowding in tents. If in barracks, have the floors elevated above the ground. A barrack with a wood roof, ridge ventilated and water-proofed canvas sides, so that they can be raised to admit air, with mosquito nettings for each man, is a ready and efficient help in the damp, hot, malarious climate against the effects of malaria.

Parkes states that even such small means as a mosquito netting is useful in preventing malarial infection.

*General hints.*—Burn all refuse from kitchen. Latrines to be inspected daily. The police of the camp and its sanitary conservancy to be rigid and exact.

No drills in full dress, or even in undress when the thermometer is near 80 degrees F., remembering the observations of Obernies on the danger from heat apoplexy from exercise at such temperature.

Inspections after sunrise or in the early evening. Scouting parties or detached parties to carry shelter tents and the usual boat cooking-stove.

If the rolling-stock of the railroad is utilized to transport troops, then use the inclosed freight cars for barracks. Canteens to be filled with weak cold tea. The detail for inspection to be minute, for "For want of a nail the shoe was lost," &c.

The greatest care must be exercised to preserve dryness in the clothing of the command, the tents, barracks, &c.

These suggestions present a summary from personal experience, and from a careful reading of the sanitary results of the Abyssinian war and the present experiences of the British army in the Soudan.

F. M. GUNNELL,
*Surgeon-General.*
JAS. E. JOUETT,
*Rear-Admiral, Commanding U. S. Naval Force on the North Atlantic Station.*

North Atlantic Station,
U. S. Flagship Tennessee (1st rate),
*Aspinwall, U. S. C., April* 17, 1885.

Sir: I send inclosed for your information a copy of my instructions from the honorable Secretary of the Navy relative to the purpose for which our Government has sent so extensive an expedition to the Isthmus of Panama, together with a copy of a letter which I addressed, upon my arrival here, to Col. Ramon Ulloa, of the Colombian Guard, the only representative of the constitutional government of Colombia who was in this vicinity at that time.

You will please require your command to carefully comply with the Department's instructions relative to the conduct of our forces while they remain on the Isthmus.

As I have already informed you, the city of Panama is now in the hands of the revolutionary forces, commanded by one Aizpuru, who assumes the title of President of the state. I do not wish to recognize the authority of the said Aizpuru in any way.

The regular Colombian forces have recently been very successful in the interior of Colombia, and I trust they will soon come to this Isthmus, re-establish the authority of the constitutional government, afford adequate security to life and property, and enforce order.

It is rumored that Aizpuru has threatened to burn Panama in case the Government forces attack him there. As the burning of Panama would cause the destruction of much property belonging to Americans, interrupt the transit, besides being an act of vandalism, you will prevent it if possible, with the force under your command.

I gave orders to this effect to Colonel Heywood before you assumed command of the force on the Isthmus.

I also learn, by rum[illegible], that there is a number of evil-disposed persons at Matachin. You will, therefore, please direct the officer commanding that post to be vigilant, in order that excesses may be prevented in that vicinity.

I do not intend to allow any arms or ammunition to be introduced into this country during the present disturbance. It is reported to me that one hundred and forty-five boxes of cartridges have recently been landed here for parties on the Isthums by the steamer City of Para. I shall have them sent back to New York by the same steamer. You will please see that all freight arriving at the Isthmus is examined by some officer of your command, and will not allow arms or ammunition to be landed without my authority.

In order to preserve the strict neutrality of the Isthmus of Panama and to avoid interruption to the transit, you will please prevent any insurgent force from landing or operating in this vicinity.

Please keep me fully informed in regard to all matters affecting your command and our interests on the Isthmus.

Send daily sick report.

Very respectfully,

JAS. E. JOUETT,
*Rear-Admiral, Commanding U. S. Naval Force on North Atlantic Station.*

Commander B. H. McCalla, *U. S. N.*
*Commanding Naval Brigade, Isthmus of Panama.*

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OFFICIAL TELEGRAM.

Washington, D. C., *April* 3, 1885.

Rear-Admiral James E. Jouett,
*U. S. S. Tennessee, Navy-Yard, Florida:*

In addition to the force under your command in the steamships Tennessee, Swatara, Alliance, and Galena, all of which should be at Aspinwall upon your arrival, you will be re-enforced by about two hundred marines, dispatched to-day from New York by the steamship City of Para with tents and camp equipage. To provide for further contingencies, supplies will be sent at once. The duty you are called upon to perform calls for the exercise of great discretion. The object of the expedition is the performance by the United States of its citizens, to preserve the neutrality and keep open the transit from Colon to Panama, and further to protect the lives and property of American citizens. The circumstances, as understood, from which the necessity for the expedition has arisen are, in general, that a steamship belonging to Americans has been seized at Colon by an armed force and goods in transit taken from her, her officers and the American Consul imprisoned, and the transit across the Isthmus interrupted. With the consequences involved in these past acts you are not concerned. Your sole duty is confined to seeing that a free and uninterrupted transit across the Isthmus is restored, and that the lives and property of American citizens are protected.

If on your arrival at the Isthmus order shall have been restored, and the Colombian authorities are adequate to the protection of life and property and the maintenance of the free transit, you will interfere in no respect with the constituted authorities, but report and await orders.

You have no part to perform in the political or social disorder of Colombia, and it *will* be your duty to see that no irritation or unfriendliness shall arise from your presence at the Isthmus.

The incidental exercise of humanity towards American citizens in exigencies must be left to your sound discretion.

W. C. WHITNEY.
*Secretary of the Navy.*

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D.

HDQRS. U. S. NAVAL FORCE ON ISTHMUS OF PANAMA,
*April* 17, 1885.

SIR: In addition to the instructions received from the commander-in-chief of the North Atlantic Station, which you will continue to enforce, be pleased to prohibit the use of all wines, spirituous and malt liquors. Report to me daily the condition of your command by the 11.30 train or by telegraph; keep me advised of the political and military situation in Panama; hold your entire force at all times in readiness to move. Make requisition on Paymaster Rand at Aspinwall for any supplies necessary to the comfort and health of officers and men. If necessary, purchase what you require in Panama and forward the bills to me. Avoid, as far as possible, ceremonies and parades. Instruct your officers and men early in the morning and late in the afternoon. Tea is better for all than coffee; use the latter but once a day; of the former you can have all that you desire.

Keep the transit open, and, should the emergency arise, exhaust every means in your power to protect the lives and property of Americans. In my absence from Panama open all cablegrams addressed to me, and repeat them either by mail or by wire as you may deem advisable. I will keep you advised of my whereabouts.

Very respectfully,

B. H. McCALLA,
*Commanding U. S. Naval Force on the Isthmus of Panama.*

Maj. and Lieut. Col. C. HEYWOOD, *U. S. M. C.*,
*Commanding at Panama.*

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HDQRS. U. S. NAVAL FORCE ON THE ISTHMUS OF PANAMA,
*Colon, April* 17, 1885.

SIR: Proceed to Matachin, in a special train that will be provided by the Panama Railroad Company to follow the 3 p. m., with the company now under your command, and relieve Lieutenant Impey and the garrison now at that place.

I have directed the commanding officers of a section of artillery and of a Gatling gun to report to you as part of your command.

Your duty will be to keep the transit open, to protect the lives and property of American citizens, and to have your command in the highest state of efficiency. Take every precaution to preserve the health and lives of your command.

Prohibit the use of wines, spirituous and malt liquors. Dispense with all unnecessary ceremony and parades. Instruct your men in the early morning and late in the afternoon, avoiding the sun in the middle of the day. Take with you 3,000 rounds of rifle ammunition in excess of what has been served out. I inclose for your guidance a copy of "Notes on Sanitary Precautions" and a copy of General Order No. 15, North Atlantic Station.

Very respectfully,

B. H. McCALLA,
*Commanding U. S. Naval Force on Isthmus of Panama.*

Capt. R. W. HUNTINGTON, *U. S. M. C.*,
*Commanding Company A, Second Battalion U. S. Marines, Colon.*

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HDQRS. U. S. NAVAL FORCE ON THE ISTHMUS OF PANAMA,
*Colon, April* 17, 1885.

SIR: You will relieve the command at garrison No. 1 at 5.30 to-day. You will dispose of your force so as to protect the water approach to Colon. A 3-inch rifle with 30 rounds shrapnel, 20 rounds shell, and the necessary primers and fuses will be issued to you.

Place a commissioned officer in charge of this gun, and direct him to instruct in its use the men necessary to work it. Issue 40 rounds of ammunition to each man, and take 1,000 rounds additional. Protect the lives and property of American citizens. Do not expose your men to the sun in the middle of the day. Instruct them early in the morning and late in the afternoon, and take every precaution to protect the health and lives of your command. Prohibit the use of wines, spirituous and malt liquors. Inclosed you will find for your guidance General Order No. 15, North Atlantic Station, and "Notes on Sanitary Precautions."

Continue to carry out the instructions now in force at garrison No. 1.

Very respectfully,

B. H. McCALLA,
*Commanding U. S. Naval Force on the Isthmus of Panama.*

Capt. R. S. COLLUM, *U. S. M. C.*,
*Commanding Company E, Second Battalion, Colon.*

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HDQRS. U. S. NAVAL FORCE ON ISTHMUS OF PANAMA,
*Colon, April* 17, 1885.

SIR: Order Capt. Geo. C. Reid, with his company, to report to Lieutenant Mason for duty in connection with the protection of trains between Colon and Panama; with the remaining two companies of 2d Battalion relieve Nos. 2 and 3 garrisons at 5.30 p. m., to-day. Aquaint yourself with the disposition of the naval forces in the vicinity of Colon, as well as the approaches to that place.

Garrison No. 3 is headquarters. In my absence you will have command of the entire naval force at Colon. Your duty is to protect the lives and property of American citizens. There is a force of one hundred men of the Colombian Government in Aspinwall.

Carry out the orders now in force in the garrison. Prohibit the use of all wines, spirituous and malt liquors in your command, and take every precaution to protect the lives and health of your officers and men. Avoid unnecessary parades and ceremonies. Keep your men out of the sun in the middle of the day as much as possible. Instruct them in the early morning and late in the afternoon. Issue 40 pounds of ammunitiom to each man and take 1,000 rounds extra with you for each company. I inclose for your guidance copies of General Order No. 15 and "Notes on Sanitary Precautions."

One Gatling gun with 1,000 rounds and caisson will be assigned to you. Be pleased to place it in charge of a commissioned officer and direct him to instruct the men necessary to its use.

Very respectfully,

B. H. McCALLA,
*Commander, Commanding U. S. Naval Force.*

Capt. J. H. HIGBEE, *U. S. M. C.*,
*Commanding Second Battalion U. S. Marines.*

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HDQRS. U. S. NAVAL FORCE ON THE ISTHMUS OF PANAMA,
*Colon, April* 17, 1885.

SIR: You will relieve Lieutenant Hosley, in command of No. 4 garrison, at 5.30 to-day, taking with you the remainder of your battalion.

Protect the lives and property of American citizens. Take every precaution to protect the health and lives of your command. Keep your men out of the sun in the middle of the day. Instruct them early in the morning or late in the evening, and avoid all unnecessary parades and ceremonies. Prohibit the use of wines, spirituous and malt liquors. Inclosed you will find for your guidance General Order No. 15, North Atlantic Station, and "Notes on Sanitary Precautions." Acquaint yourself with the regulations in force at the garrison and carry them out until further orders.

With regard to this garrison, the importance of guarding the causeway by which an insurgent force would be apt to approach is called to your attention.

Very respectfully,

B. H. McCALLA,
*Commanding U. S. Naval Force on the Isthmus of Panama.*

Lieut. C. O. ALLIBONE, *U. S. N.*,
*Commanding Gatling Battalion, Colon.*

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HDQRS. U. S. NAVAL FORCE ON ISTHMUS OF PANAMA,
*Colon, April* 17, 1885.

SIR: You will relieve Lieutenant Kimball in command of the train guards in time to place guards on the early train to-morrow morning. Capt. Geo. C. Reid, U. S. M. C., has been directed to report to you with the company under his command. In addition, you will have the two remaining sections of your battalion.

Acquaint yourself with the duties now performed by Lieutenant Kimball's command. Keep the transit open. Protect the lives and property of Americans. Enforce the regulations of the railroad company. Consult with Mr. Burt, the superintendent of the Panama Railroad, and do anything in your power to aid him and the officials of the trains in guaranteeing safe conduct to passenger and freight. Take every precaution to preserve the health and lives of your command. Omit unnecessary ceremonies and parades. Prohibit the use of wines, spirituous and malt liquors. Protect the men from the sun as much as possible in the middle of the day, instructing them early in the morning and late in the afternoon. Your attention is called to the necessity of exercising tact in the important duty assigned to you.

Inclosed you will find for your guidance General Order No. 15, North Atlantic Station, and "Notes on Sanitary Precautions."

Very respectfully,

B. H. McCALLA,
*Commanding U. S. Naval Force on the Isthmus of Panama.*

Lieut. T. B. M. MASON, *U. S. N.*,
*Commanding Battalion of Rifled Guns, Colon.*

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## G.

Commander Bowman H. McCalla, U. S. N., Commanding.

### PERSONAL STAFF.

Lieut. William S. Cowles, U. S. N., adjutant-general.
Lieut. William H. Reeder, U. S. N., A. D. C.

### GENERAL STAFF.

Paymaster Stephen Rand, jr., U. S. N.
Passed Assistant Surgeon Robert Whiting, U. S. N.

### COLON GARRISON.

Capt. J. H. Higbee, U. S. M. C., Commanding; First Lieut. W. F. Spicer, U. S. M. C., adjutant.

*Post* 1.—Capt. R. S. Collum, U. S. M. C., Commanding; First Lieut. S. H. Gibson, U. S. M. C., and Second Lieut. H. K. Gilman, U. S. M. C.; Company B, Second Battalion, 50 men, and one 3-inch B. L. R.

*Post* 2.—Capt. F. H. Harrington, U. S. M. C.; First Lieut. Henry Whiting, U. S. M. C.; Company E, Second Battalion, 50 men.

*Post* 3.—Lieut. T. B. M. Mason, U. S. N., Commanding; Lieut. Wainwright Kellogg, U. S. N.; Ensign H. M. Witzel, U. S. N., and 31 blue-jackets and one gatling. Capt. W. S. Muse, U. S. M. C.; First Lieut. R. Wallach, U. S. M. C.; Second Lieut. F. E. Sutton, U. S. M. C.; Company C, Second Battalion, 50 men. Capt. S. C. Reid, U. S. M. C.; First Lieut. W. F. Spicer, U. S. M. C.; Second Lieut. S. L. Jackson, U. S. M. C.; Company D, Second Battalion, 50 men.

*Post* 4.—Lieut. O. Allibone, U. S. N., Commanding; Junior Lieut. C. J. Badger, U. S. N.; Gunner J. J. Walsh, U. S. N.; 50 blue-jackets, one gatling, one 3-inch B. L. R.

Armored car—Hotchkiss Rev. Cannon, one gatling, one S. B. howitzer.

Paymaster Stephen Rand, U. S. N., clerk and yeoman.

Past Assistant Surgeon Robert Whiting, U. S. N., and apothecary.

| | |
|---|---|
| Officers | 21 |
| Marines | 200 |
| Blue-jackets | 81 |
| Yeomen | 1 |
| Apothecary | 1 |
| Total | 304 |

### GARRISONS OF MATACHIN DISTRICT.

Capt. R. W. Huntington, U. S. M. C., Commanding.

### *Matachin Post.*

Second Lieut. Carroll Mercer, U. S. M. C., 39 marines; Junior Lieut. J. C. Colwell, 38 blue-jackets, one Gatling and one 3-inch B. L. R.

### *San Pablo Post.*

First Lieut. Geo. F. Elliott, U. S. M. C., Commanding, 13 marines; Junior Lieut. Alexander Sharp, 12 blue-jackets, one 12-pounder S. B.

| | |
|---|---|
| Officers | 5 |
| Marines | 52 |
| Blue-jackets | 50 |
| Total | 107 |

### PANAMA GARRISON.

Major and Bvt. Lieut. Col. Charles Heywood, U. S. M. C., Commanding; First Lieut. H. G. Ellsworth, U. S. M. C., adjutant.

*Company A.*—Capt. E. P. Meeker, Second Lieut. T. S. Fillette, 51 men.

*Company B.*—Capt. L. E. Fagan, First Lieut. Jesup Nicholson, 51 men.

*Company C.*—Capt. H. C. Cochrane, First Lieut. F. L. Denny, 50 men.

*Company D.*—First Lieut. O. H. Berryman, Second Lieut. J. A. Turner, 49 men.

*Company E.*—Capt. R. L. Meade, Second Lieut. A. H. Clark, 37 men.

First Lieut. A. C. Kelton, U. S. M. C., brigade quartermaster.

Assistant Surgeon F. N. Ogden, U. S. N.

Shenandoah's marine guard, First Lieut. T. N. Wood, 20 men.

Shenandoah armored car, Hotchkiss Rev. Cannon, one Gatling, one 12-pounder howitzer; Lieut. E. M. Hughes, Ensign J. H. Oliver, 60 men.

Alliance, Naval Cadet C. P. Plunkett, 24 men.

Swatara, Junior Lieut. F. E. Sawyer, 24 men.

| | |
|---|---|
| Officers | 19 |
| Marines | 258 |
| Blue-jackets | 108 |
| Total | 385 |

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## H.

HDQRS. U. S. NAVAL FORCE ON THE ISTHMUS OF PANAMA.
*April* 22, 1885.

SIR: In the event of it becoming necessary to occupy Panama this command will advance in three columns: The column on the right to be composed of two companies of the second battalion of marines, the field-pieces, and two Gatling guns, under command of Captain Collum. This column will advance from the new passenger station along the Chemin de la Savane to its junction with the road leading to the French hospital This junction is marked by a short broken column on a pedestal. One company, with a field-piece, will advance and occupy the road leading to the cemetery road, which it will occupy, and advance along the Carrera de Cocle to the junction of the Carrera de Bolivar and the Carrera de Camillo Torres; from thence by the Carrera de Camillo Torres and the Carrera de Caldas to their junction with the Carrera de Sucre. The remaining company of the column will advance by the Carrera del Isthme or the Carrera de Veraguas to the Plaza Santa Ana, which it will occupy and hold. Should the Plaza Santa Ana have been occupied by the center column, this part of the force, which should be under the command of Captain Collum, will relieve the force which occupies it.

The center column, consisting of two companies of the first battalion of marines, one field-piece, and one short Gatling gun, will advance by the Carrera de Colon to the Carrera de Chiriqui and occupy one end of the Plaza Santa Ana, moving into the plaza by the Carrera del Isthme, or by the street to the northeast leading into the Calle de la Cherrera.

The Plaza de Santa Ana will be occupied by one company and one piece of artillery, the remaining company and Gatling to advance either by the Carrera de Pais or the Carrera de Bolivar to the Plaza de la Cathedral and occupy the hotel of Mr. Shuber, marked "H" on the map.

As soon as the force from Captain Collum's battalion shall reach the Plaza Santa Ana the commanding officer of that portion of the center column holding the plaza will advance either along the line of the Carrera Constitution or the Carrera de Caldes to the telegraph station, which it will occupy. The left column, under your personal command, consisting of two companies of the first battalion, one field-piece, and one short Gatling gun, will advance by the beach if the tide permits, or by the street running parallel with the beach, to the angle just to the northward of the Carrera de la Chiriqui, marked with a * on the plan of the city, thence by the street leading into the Chiriqui, past the marked house to the Plaza Alfaro; thence by the Carrera de Cordova to the American consulate and the Pacific Mail office, which it will occupy. It is intended in these instructions to give the general directions of the advance and the places to be occupied.

The object of the naval force under my command is to protect American property and the lives of American citizens. This must be done at all hazards.

As soon as the landing party from the Shenandoah, which shall be signaled for before the advance is made from Camp Jouett, the officer commanding the reserve, which shall consist of the present naval force not detailed as part of the right, center, and left columns, will advance to the Plaza Santa Ana and wait for instructions. The landing parties from the Shenandoah (and Iroquois, if here) will hold Camp Jouett.

Should the city be fired, every effort compatible with the above instructions will be made to extinguish the fires.

Should resistance be made to the advance, direct the commanding officers to overcome it; shoot all who may be found firing or attempting to fire or blow up buildings. Capture and disarm all persons found with arms in their hands, unless it is positively certain that they belong to the National force. These instructions do not apply to the forces that may be landed from foreign ships of war in the harbor to protect foreign property. Avoid collision with them. Instruct the commanding officers of battalions in writing in accordance with these orders, and direct them to report to me at 1 o'clock to-day with a rough drawing of the plans of Panama.

Have the entire force under your command disposed for an advance into Panama as above directed at 5.45 p. m. to-day for my inspection. Have the men thoroughly instructed to-day in the principles of street firing. Have the canteens filled, and instruct the men always to put them on when the long-roll is sounded or when they fall in, in readiness to repel an attack. Report to me at 1 o'clock to-day in writing that the preparations and instructions contained herein have been carried out.

Lieutenant Cowles and Lieutenant Reeder are my aids, and all instructions given by them in my name will be implicitly obeyed.

Should an advance be made into Panama, I will be found with the center column, which will carry the colors of the First Battalion of Marines.

Very respectfully, your obedient servant,

B. H. McCALLA,
*Commanding U. S. Naval Force on the Isthmus of Panama.*

It is a sound military principle never to underrate the strength of an enemy.

B. H. McCALLA.

Major and Bvt. Lieut. Col. CHARLES HEYWOOD, *U. S. M. C.*,
*Commanding Garrison at Panama.*

*Supplemental instructions for occupying Panama.*

HDQRS. U. S. NAVAL FORCE ON ISTHMUS OF PANAMA,
*Panama, April* 26, 1885.

ORDER.

Should an advance be made into the city to-night the following changes will be made in my order of the 22d, viz:

Lieutenant Allibone's column, consisting of two companies of the Second Battalion of Marines, one Gatling and one field-piece, will advance by the Chemin de la Savane to the Plaza Santa Ana, which it will occupy and hold until the arrival of Captain Collum's command. Upon the arrival of Captain Collum Lieutenant Allibone will push forward with one company of marines and a Gatling to the Cathedral Plaza and occupy the Cathedral. Captain Meade's column will advance to the Plaza de la Cathedral and then by the Carrera de la Sucre to the telegraph office, leaving one company and a Gatling at Shuber's Hotel. Captain Collum's command will advance at once to the Plaza Santa Ana by the Chemin de la Savane, relieving Lieutenant Allibone.

Lieutenant Mason, with the remaining force, will assume command of Camp Jouett, making the best disposition of his force to protect the camp. Be pleased to caution the commissioned officers against shell-firing, which is liable to set fire to the town, and indiscriminate firing with the Gatling guns and rifles.

Upon the arrival of the landing parties from the ships in the bay the landing party from the Iroquois will be sent directly to the Plaza Santa Ana, unless otherwise directed. The force from the Shenandoah will re-enforce the garrison at the camp. Should the town be fired every effort must be made to suppress the flames, and the only feasible way is to tear down buildings in their path. Sentinels will be established about the parallelogram embraced generally by the bay on two sides, the Carrera de Camillo Torres, Carrera de Narino. Great care must be taken by the several colums not to fire into each other.

B. H. MCCALLA,
*Commanding U. S. Naval Force on Isthmus of Panama.*

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J.

Entre B. H. McCalla, commandante de las fuerzas navales de los Estados Unidos en el Istmo de Panama, y Rafael Aizpuru, presidente del Estado Souberano de Panama, se ha Celebrado el siguiente convenio.

ARTICULO I. El Senor Commandante B. H. McCalla, una vez firmado este convenio, hara retirar las fuerzas americanas que ocupan la cuidad de Panama a las Cuarteles ocupados hasta ayer en el vecindario de la linea y estacion del ferrocarril interoceanico.

ART. II. El Senor Presidente Aizpuru se obliga a cumplis con el deber de dar completa proteccion a la vida e intereses de los Americanos y demas extranjeros que habitan la cuidad de Panama; no consentira combate alfuero en su reciuto, ni construira barricados en las calles.

ART. III. El Senor Commandante McCalla se compremete a no tomar parte en las luchas politicas.

Se firman dos ejemplares de un tenor en Panama, a 25 de Abril de 1885.

B. H. MCCALLA.
*Commander, United States Navy.*
R. AIZPURU.

## K.

HDQRS. U. S. NAVAL FORCE ON ISTHMUS OF PANAMA,
*Panama, April 27, 1885.*

SIR: Proceed to Paraiso and occupy the depot there temporarily. Do not interfere with the local government. Make inquiries quietly as to the cause and facts of the recent shooting at Paraiso, and notify me. Take no part in any controversy.

You are sent there merely to see that the transit is kept open. Let any foreigners remain within your lines who apply for protection.

Very respectfully, &c.,

B. H. McCALLA,
*Commander, U. S. N., commanding.*

Capt. GEO. C. REID, *U. S. M. C.,*
*Commanding D Company, Second Battalion.*

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HDQRS. U. S. NAVAL FORCE ON ISTHMUS OF PANAMA,
*Panama, April 28, 1885.*

SIR: Proceed to Paraiso and relieve Captain Reid, U. S. M. C., now in command at that place.

Take a copy of his instructions, and govern yourself accordingly.

Very respectfully,

B. H. McCALLA,
*Commander U. S. N., Commanding.*

Lieut. T. B. M. MASON, *U. S. N.*

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## M.

## CAMP DAISY.

*Special instructions issued to pickets and men at San Pablo, United States of Colombia.*

(First Lieut. G. F. Elliot, U. S. M. C., commanding post.)

### INSTRUCTIONS FOR PICKETS AT BRIDGE.

*Force.*—One corporal, one patrol, and two privates.

*Duties of corporal.*—Relief being turned out, see that each man gets a cup of coffee and a piece of hard bread before relief is formed, and that he has his poncho. Form relief. Load pieces in front of the guard-house. See that the guns are at half-cock and the magazines shipped.

### POST NOS. 1 AND 4.

March Nos. 2 and 3 with patrol to the bridge, posting No. 2 with patrol at east end, and remaining himself with No. 3 at west end, until sentinel in front of guard-house calls the half hour, when he will exchange places with the patrol.

On being relieved corporal will march relief back to guard-house, face toward the railroad, and cause pieces to be unloaded.

*Patrol.*—Will keep sharp lookout with sentinel; will shift from one end of the bridge to the other every half-hour, giving notice to the corporal of the guard of anything unusual.

In case of attack the entire relief will rally to the east end of the bridge and defend it to the last extremity The garrison will hurry to their assistance. In case a rocket should be fired the relief will fall back from bridge, passing under cover of railroad embankment opposite battery so as to be covered from shell-fire.

The relief will obey the orders of the corporal of the guard implicitly.

Remember! cool, deliberate firing will cause any force to respect the individual soldier.

### RESPECTING MEN UNDER SENTINEL'S CHARGE.

The men will be kept under sentinel's charge. All requests from men will come through the sentinel, who has no power to grant such requests himself, but will make them known to the officer of the guard.

The men will report to the sentinel on going to the rear, and if they remain longer than ten minutes the sentinel will report it to the officer of the guard.

Allow no one to hold any conversation with men placed under your charge, and speak to them only when necessary.

### DAILY ROUTINE.

6.30 a. m. Reveille and early coffee. Men allowed to bathe until 6.50.
6.50 a. m. Sick call. Men will receive quinine furnished by medical officer.
7.00 a. m. Breakfast; half-hour for smoking.
7.30 a. m. Air bedding, weather permitting.
8.00 a. m. Police work.
11.00 a. m. Bedding brought in and rolled up. Inspection of quarters.
12.30 p. m. Dinner.
1.00 p. m. Beds rolled down and men kept in quarters till 5 o'clock.
5.00 p. m. Supper.
5.30 p. m. One-half of garrison march to bathe.
6.00 p. m. Remainder of garrison march to bathe.
9.00 p. m. Tattoo.
9.15 p. m. Taps.

### SANITARY REGULATIONS.

1. Air bedding every morning, if fine.
2. Bathe in evening.
3. Keep out of the sun in heat of the day.
4. Quinine to be taken before breakfast.
5. Meals at regular hours.
6. No drinking of liquors of any kind.
7. Use for drinking only distilled water.
8. Keep bowels open.
9. Keep sentries in tents during day.
10. Inform officer of the guard if perspiration is stopped on warm days.
11. If feeling giddy, wild, with headache, &c., inform officer of the guard.
12. No drill during the heat of the day.
13. Keep out of night air as much as possible.
14. Close windows and doors at tattoo.
15. Wear flannel next to skin at night.
16. Change wet clothes as soon as relieved.
17. Never put on damp clothing. Allow undersuit worn one day to hang and dry the next, putting on a fresh suit.

## O.

*Force employed during the occupation of Panama, April 24, 1885.*

AT 2 P. M.

| | Officers and men. |
|---|---|
| Right column | 145 |
| Center column | 150 |
| Left column | 151 |
| Depot | 70 |
| Total | 516 |

AT 10.30 P. M.

| | Officers and men. |
|---|---|
| In city | 482 |
| At depot | 154 |
| Picket line outside city | 188 |
| Total | 824 |

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## P.

GENERAL ORDER No. 19.

NORTH ATLANTIC STATION,
U. S. FLAGSHIP TENNESSEE (1st rate),
*Aspinwall, U. S. C., May* 7, 1885.

The Commander-in-Chief takes great pleasure in expressing to all the officers and men of his command his high appreciation of their services on the Isthmus of Panama. Their strict attention to duty, their high state of discipline and efficiency, their promptness in emergencies, and above all their forbearance in delicate and critical situations, have won the respect and admiration of all.

He will not fail to represent fully to the Navy Department how well all have done, and with what alacrity and devotion officers and men have hastened at every call of duty.

He extends his sincere congratulations to all his command, that the object of their mission has been accomplished peacefully, and with honor to themselves and to their country.

To those who are about to return to their homes he wishes a joyous meeting with their friends, and to each and all long life and happiness.

This order will be read at muster on board each vessel of the squadron, and to the battalions on shore.

JAS. E. JOUETT,
*Rear-Admiral, Commanding U. S. Naval Force on the North Atlantic Station.*

# EXTRACTS FROM REPORT OF LIEUT. W. W. KIMBALL, U. S. N. U. S. S. TENNESSEE, MAY 25, 1885.

* * * * * * *

All the ships of the North Atlantic squadron, except the Yantic which was left at Livingston, Guatemala, to attend to American interests at that point, were now assembled (10th April) at Aspinwall, where also arrived on the morning of the 11th, by the steamer Para, 214 officers and men of the Marine Corps under Major Heywood.

At this time the Panama Railroad and Pacific Mail property was guarded in Aspinwall by the landing force of the Galena and in Panama by that of the Shenandoah.

Relief trains had been run over the road, taking refugees from and bringing food to Aspinwall, but the transit was precarious and the superintendent of the Panama Railroad declined to attempt regular traffic until protection was assured. On the evening of the 10th, a few hours after arrival, and as soon as the number of the available men could be reported, the commander-in-chief issued orders in detail for the landing of a force sufficient for opening and maintaining the transit across the Isthmus and for the protection of all American interests upon it.

The detail was as follows:

For garrison at Panama, 214 officers and men of the Marines; and 45 officers and men of the Navy, with one Gatling and one 3-inch B. L. R., under command of Major Heywood, U. S. M. C.

For garrison at Matachin: 55 officers and men of the Marines; and 35 officers and men of the Navy, with one Gatling and one 3-inch B. L. R., under command of Lieutenant Wainwright, U. S. Navy.

For garrison at Aspinwall: 25 officers and men of the Marines; and 160 officers and men of the Navy, with three 3-inch B. L. R. and one 12-pounder S. B. howitzer, under Lieutenant Colahan, U. S. Navy.

For train guards: 42 officers and men of the Marines; and 58 officers and men of the Navy, with two 37-millimeter Hotchkiss guns, two Gatlings, and two 12-pounder S. B. howitzers, under command of Lieutenant Kimball, U. S. Navy.

The commander-in-chief also directed the fitting up of two flat cars with steel bullet-proof breastworks, gun platforms, &c., to take the artillery of the train guard. (See Plates 5 and 6.)

These cars were intended for out-post duty in case of a regular opposition by the revolutionists, as well as for patrol of the line after the transit was opened, and consequently each was so fitted as to deliver the fire of three guns, one 37-millimeter, Hotchkiss, one Gatling, and one 12-pounder S. B. Howitzer on either beam, and that of the Hotchkiss and Gatling ahead or astern, while the Gatling or the 12-pounder S. B. howitzer could be disembarked for use in the field at any point. On the morning of the 11th April the signal to land the above force was made, and within six hours the troops were all on shore, those for Aspinwall established in the posts mentioned, and those for Matachin and Panama embarked on railroad trains with camp equipage, ten days' rations, and distilled water from the ships. In the same time the armed cars had been fitted and were ready to move. The commander-in-chief directed the force detailed for Matachin and Panama to move out at 3 p. m. in two trains, the first consisting of an armed car ahead, with crew at quarters, passenger coaches filled with the marines, a passenger coach with the passengers of the Para, and an armed car with crew at quarters in rear; the second, closely following, consisted of passenger, box, and flat cars taking the garrison for Matachin, the artillery for Panama, and the rations, water, and camp equipage of the whole moving force. At this time Panama was in the hands of the Revolutionists, and Aspinwall was held by the small party of Nationalists that had defeated Prestan, but the whole country through which ran the Panama Railroad was utterly destitute of any government or authority whatever, civil or military. In view of this, and of the well-known fact, that among the fifteen or twenty thousand people living along the line of the canal there were many dispersed Revolutionists and desperadoes from all parts of the world, the commander-in-chief decided to make the moving force so strong that not only could any offered opposition be easily overcome but that the lookers on would be impressed with the folly of any attempt in that direction.

No opposition or detention was experienced, and by sunset the garrisons were established in obedience to the orders of the morning, the men and officers all quartered under roofs, mostly those of the Panama Railroad Company, the transit was opened and insured, and all legitimate American interests on the Isthmus given adequate and satisfactory protection. On the 12th April regular schedule trains began to run over the road, the six daily passenger trains being furnished with a guard; the important ones being attended by an armed car. Since the formal opening of the transit there has been no attempt at interfering with it by any one along the line.

The force as detailed and disposed on the 11th being ample for all purposes, the blue jacket infantry of the Shenandoah's landing party was relieved and returned to their ship. A few days afterward a garrison was ordered to be established at San Pablo and a picket thrown out for the protection of the Barbacoas bridge. As soon as rations for the purpose could be landed they were issued to the distressed at Aspinwall, including the Nationalist soldiers at that point, business was resumed, rebuilding the burned town was begun, confidence was established, and affairs on the Isthmus were generally quiet.

For the prompt arrangement of the trains on the 11th, for the furnishing workmen and materials for fitting up the armed cars, for the transportation of rations and water, for the providing of quarters in the railroad stations and afterward in barracks built by him for the purpose, the United States forces were indebted to Mr. George A. Burt, superintendent of the Panama Railroad Company. Owing to the efforts of this gentleman, none of the troops had to suffer the discomforts and sanitary dangers inseparable from quartering under canvas in the climate of the Isthmus. He gave up his own house for headquarters at Aspinwall, messed the officers there established, and in general rendered all possible aid, assistance, and advice in the numberless difficulties and delicate details entailed upon the landing of so large a force in a foreign and friendly country where two different government authorities were asserted, and where, as regards the Isthmus, except at two points, none whatever was exercised.

Having received information that Prestan was about to leave Porto Bello in a schooner bound for Cartagena, the commander-in-chief on the 14th sent the Swatara with orders to cruise for him as far as the last named port and to furnish the Powhatan lying there with needed provisions. The Swatara boarded a small schooner off Porto Bello, but failing to find Prestan, she carried out her orders in regard to provisioning the Powhatan. At Cartagena she found the town in the possession of the Nationalists under Santo Domingo Vila, besieged by the Revolutionists, about 3,000 strong under General Gaitan. The Revolutionists had two small river steamers and two tugs, one of which was the Gamecock, fitted up with boiler-plate shields and a 12-pounder Armstrong gun. The Nationalists also had a couple of shielded river steamers. On the 20th the Swatara returned to Aspinwall, bringing a request from President Vila for transportation for himself and troops to Aspinwall, which request was of course, not granted.

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A couple of days previous to the occupation of Panama the Alliance sailed from Aspinwall for Cartagena, under orders from the commander-in-chief to take Lieutenant Very on a confidential mission to General Santo Domingo Vila, President of the State of Panama. When off Sabanilia at sea a brigantine was sighted, under full sail, which, as she came up, first showed Haytian and then Colombian colors. A blank cartridge was fired, when she hauled down the Colombian colors and hoisted what was afterward found to be the flag of the revolution, a red cross on a white field, but did not heave to. A shot was then thrown across her bows, when she hove to and was boarded. She was found to be an American-built vessel, but with no American papers later than 30th June, 1884, although she had been in Boston, Mass., in the spring of 1885. It appeared that she had been sold to one Pedro Sara, styling himself civil and military chief of Barranquilla, a province of the State of Bolivar, and by him commissioned as a man-of-war and armed with a 32 pounder carronade. Knowing that no governor of a State and much less a governor of a province, had authority to commission a vessel of war to cruise on the high seas, Commander Clark seized her as a pirate, under paragraph 18, page 137, of the United States Navy Regulations, and by authority of various precedents and rulings quoted by Wharton, Vattel, Woolsey, and others. As she had on board 17 officers and 37 men of the Revolutionary army, Commander Clark took them, with their arms and ammunition, on board the Alliance for safe-keeping, put a prize-crew on board the brig under command of Lieutenant Wright, and sent her in to Aspinwall, where she arrived on the 26th April.

At 12.30 a. m. of this date the superintendent of the Panama Railroad came on board the flag-ship and reported that the telegraph wires were cut, and that communication was cut off beyond Gatun. As a Revolutionist force might have arrived at that point, the commander-in-chief ordered a force of 100 blue-jackets, in a train with an armed car, under Lieutenant Wainwright, to move out at daylight and see the wires in order through to Panama. Accordingly the train left at daylight, but upon arriving at Bohio Soldado it was found that the line had been grounded accidentally, and that all was quiet along the railroad, and consequently the force moved back to Aspinwall.

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A greater or less United States force was continuously on shore in Colombian territory from the 30th March to the 25th May.

### QUARTERS.

The force landed on the 11th was quartered at the posts mentioned in Aspinwall in buildings belonging to the Panama Railroad and to the Pacific Mail Company, the men sleeping on the floors. The quarters were as a rule sufficiently comfortable except those at the Pacific Mail wharf, which consisted of a small cooper shop badly located and badly ventilated. This was improved as much as possible by the carpenter's gang of the Tennessee, who rigged sleeping benches and racks for arms and accoutrements. The quarters at this post were afterward moved to a small building on the other side of the wharf. The company did not wish any portion of the freight-shed used for quarters, as the rush of freight was so great. At the other posts the men slept upon verandas and in some unused buildings. * * * Four small barrack-buildings, quartering about 50 men each, were planned by Lieutenant Colahan and built by Mr. Burt, superintendent of the Panama Railroad.

These were light scantling, iron-roofed buildings, fitted with sleeping-benches, and as the men brought with them their hammocks and the straw mattresses from the steamer, they were quite comfortable for the people quartered in them. At Matachin (see plate No. 8) the people slept upon the platform of the railroad station, which had a shed roof over it. A couple of staysails were used to keep the rain from driving under the ends. At Panama two large freight stations were provided for quarters. In one the open spaces in the floor for two railroad tracks were floored over, thus giving space for four lines of men to sleep, and still leave room to form companies between the lines. No tents were used as quarters.

## RATIONS AND COOKING.

The Navy regulation rations were served out to the force on shore, except to the detachment which arrived in the Acapulco, which came provided with extra ones. The cooking was done at camp fires and on boat stoves near the quarters, and, as a rule, was fairly good. In the extra rations brought by Commander McCalla's command, the tinned corned beef and the sausage proved particularly serviceable ashore, especially for the train guards and for men who could not be in camp at meal times.

Shelters or awnings were rigged over the kitchens, and the boat stoves were in some cases supplemented by stoves taken from burned houses.

## WATER.

Distilled water from the ships was provided for drinking by means of breakers sent filled to the posts and returned empty. It was difficult to always supply the proper amount on account of the breakers going adrift on the railway trains, and when the supply was short the water from Frijoles, which, upon analysis, proved good, was made use of.

## CLOTHING.

The fatigue dress of the marines proved serviceable, as did the clothing of the blue-jackets; these last used working clothes at times during the day, which proved comfortable but were of course considered bad in color for actual fighting. The helmets of the marines proved too heavy and gave too little protection from the sun, while the absurdity of most of the blue-jackets' head-gear was more than usually apparent. The blue-jackets sent out from New York were provided with straw hats which proved serviceable.

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## EQUIPMENTS.

The canteens and haversacks were all that could be expected, and the blanket-packs proved very convenient. The McKeever cartridge-boxes of the marines held the cartridges well, but as no man had more than two the supply of ammunition was less than one-half what it should have been. These boxes take but twenty rounds each. The blue-jackets from the ships were provided with old regulation and

Hitchcock boxes, neither of which hold the cartridges securely, nor do they, when filled, furnish more than half a proper supply of ammunition. The new double Mills belts, with pockets for magazines, seem extremely well suited for use. The cartridges are securely held, the supply is sufficient, and the weight is well carried by the shoulder-straps. Some complaint was made that the cartridges stuck in the loops when the belts were wet, but this trouble seemed to occur because the men did not to push the cartridge up by the bullet instead of trying to pull it out by the head.

## SMALL-ARMS.

As but few shots were fired, and those mostly by sentries on post, the faults and good points of the small-arms were not made prominent. The Springfields, in the hands of the marines, showed a great weakness in the breaking of many firing-pins under the sledge-hammer blows of the awkward dock, but the absurdity of the breech mechanism and the poor system of rifling were not accentuated because the arms were so little used.

The old model Hotchkiss, with which some of the blue-jackets were armed, freely exhibited its well-known deficiencies—the weakness of the butt-stock and the inefficiency of the bolt-lock. The Remington-Keene, from the Tennessee, showed clogging of the bolt-lock, failure of carrier action, leakage of the cut-off, and general inefficiency.

The Lees, in the hands of the blue-jackets of the force sent out from New York, proved strong and serviceable. The lack of thumb-hold on the cocking piece was felt, and the sights were poor. The lack of slings on the Hotchkiss and Remington-Keene's was quite a serious one, and the fact that all the blue-jackets were provided with a low-power cadet-sized arm was regretted.

## SIDE-ARMS.

Like the small-arms these were not used enough to prove anything new. The cutlasses were considered good, the revolvers fair, and the pistols bad.

## ARTILLERY AND MACHINE GUNS.

Of course nothing new was learned as to the firing or effect of these arms. The 3-inch B. L. rifle howitzers seemed in every way efficient, as in their way did the 12-pounder S. B. howitzers, which last might, it was thought, prove particularly serviceable on the Isthmus, where there was no artillery to oppose them, and where short-range canister fire might be needed. There was not marching enough over rough country to accentuate the faults of the trail-wheel carriages. The Gatlings, both long and short, seemed to be all that could be expected of them in handiness, &c., but the lack of method to supply ammunition for these arms was apparent. Two Hotchkiss 37-millimeter revolving cannons were landed for mounting in the armed cars; the lack of a boat-mount made it necessary to fit standards aboard ship. As it was considered better to keep all the four sockets of the regular ship standards in place, sockets had to be improvised from boiler plate and boiler tubing. A cone boat mount for these weapons would be very convenient on shore, for they make excellent guns of position.

## ARMED CARS.

These were two flat cars fitted up as follows:

Stanchions standing 44 inches above the floor of the car were firmly wedged in the sockets, and inside them was placed one-half inch steel boiler plates 42 inches wide. The bottom edges of the plates were held in place by cleats running the length of the cars, and the top edges by iron clips depending from bolts passed through the heads of the stanchions in the 2 inches of head that projected above the plate. The clips were held hard against the plates by nuts upon the bolts. The ends of the car were too wide for the steel plate at hand, and so two thicknesses of one-fourth inch iron were used there.

Amidships of the cars on both sides were spaces without shields, wide enough to admit a Gatling or 12-pounder S. B. howitzer field carriage by "cutting" the wheels back and forth. These spaces were left as embrasures for the 12-pounder S. B. guns, and for openings through which to disembark either of the field pieces of the armament. A plate was provided and fitted with clips for use as a port shutter on the disengaged side, and eye-bolts were fitted for making fast the breeching to keep the guns from recoiling too violently against the shutter or from going overboard if the rear embrasure were left open. At each end of the car were platforms 10 inches high, 5 feet in fore-and-aft dimensions, and the width of the car inside the shield, one of which was occupied by the short Gatling on field carriage, and the other served as a base into which to frame and brace the Hotchkiss cannon standard. These platforms were built in order to lift the Gatling and Hotchkiss high enough to fire en barbette. Thus all three guns could be brought to bear abeam, while the Hotchkiss and the Gatling gave fire ahead and astern. To the stanchions were spiked uprights carrying a roof covered with water-proof felt. A wire was stretched around under the eaves and awning curtains, bent so that rain and smoke could be kept out. By paying a little attention to stowage a car so fitted was found to be commodious enough to comfortably take its armament with full supply of ammunition, the crew of thirty men all told, with arms and equipments, two days' rations and water, and still leave room enough to work the guns and deliver a small amount of rifle fire.

## BEHAVIOR OF THE MEN.

The marines sustained their well-known reputation for steadiness and effectiveness, doing their duty very satisfactorily and showing but few infractions of discipline.

The blue jackets fell into their shore duties well, and, as a rule, were reliable as sentries.

### HEALTH OF THE FORCE.

As the rainy season did not set in till the 20th May, the health of the men was generally good.

The officers and men of the squadron and 1st battalion suffered considerably from climatic diseases, and at this date, 25th May, the number on the "sick-lists" is rapidly increasing.

Six deaths have occurred within a month; two from gunshot wounds (one man shot in trying to run the lines, and the other in a brawl), one from typhoid, and three from yellow fever.

# EXTRACTS OF MEMORANDA UPON THE EXPEDITION TO THE ISTHMUS, ADDRESSED TO THE HON. THE SECRETARY OF THE NAVY.

By Lieut. T. B. M. Mason, *U. S. Navy.*

## ORGANIZATION.

In order to carry out comfortably, as well as efficiently, the objects of such an expedition, a thorough system of organization, which shall define the duties and responsibilities of each individual, is required. Army customs are based upon long experience in the field and we cannot d better than to study them thoroughly, and enforce them strictly on such expeditions.

*  *  *  *  *  *  *

I am convinced that the company is the best unit of organization. When called upon to execute marches, parades, &c., the companies may be united as battalions, but unless the number of companies is very large one battalion would be much preferable. This is also true of the artillery organization; a section should be the unit, batteries only existing temporarily.

*  *  *  *  *  *  *

Next to the commanding officer the commissary is the most important, and should be most carefully selected.

A quartermaster (a line or marine officer) should have charge of assigning and looking after the quarters of the force.

The organization of the medical staff, with a sufficient and *healthy* set of assistants of all grades, would have lightened the duties and anxieties of the medical officers detailed for the expedition, to whom too much praise cannot be given for their untiring attention and care. The instruction given by Dr. Whiting to the officers and men on the passage to Aspinwall undoubtedly saved several lives.

The fact is probably deeply underlined in the memory of every officer who had the actual care of his men on his mind that a large permanent detail for service in the auxiliary corps is an absolute necessity. The fighting force may be thereby reduced in numbers, but not in strength or effectiveness. Per contra, the permanent details should not be used as a fighting force, except in an emergency to defend the base.

A regularly educated and properly qualified set of permanent petty officers is required in the service. The mere filling of rates because vacancies exist; the sudden and sometimes ill-advised disrating of petty officers; the rating of men as petty officers because they are good sailors on board ship; the equal treatment of a petty officer and the worst man on board under the present methods of the service; the over-marking of men on their transfer papers from a mistaken idea of generosity in order to insure continuous service papers, prevent the selection of good men to fill ratings, especially in an emergency such as the hurried fitting out of this expedition. The consequence is that officers have to perform much duty which in the Marine Corps and Army falls to the non-commissioned officers. This is bad for officers and petty officers. It gives the first too much work of a petty nature, taking time which should be devoted to more important duties; it takes from the latter the chance of establishing their superiority over the men they command. The quartering and messing of the petty officers in the cabin of the Acapulco on the passage down had an excellent effect in most cases, and would have had much more were it not that it was found that some of the men selected turned out to be the most incorrigible drunkards in the whole command, a fact that could only be developed by experience, as their papers were as good as those of the men who filled ratings to everybody's satisfaction during the whole expedition.

What has been said in regard to petty officers refers equally to the other rates which do not carry petty officers' rank. It would naturally be supposed that where there are several grades of seamen (or more properly speaking men-of-war's men) that only those who were thoroughly competent to perform all of the duties of a well-instructed man on board a man-of-war would be found in the first grade; that an imperfect knowledge of mere sailoring should entitle a man to draw more pay than an ordinary seaman who is perfectly instructed in every branch of naval requirements, and probably knows more about the naval methods than his superior, green from the merchant service, seems to show a screw loose somewhere and demand a change.

The machinists, firemen, and coal-heavers taken out from New York proved as effective, and in many cases more effective, members of the expeditionary force than the men from the seamen class.

## EQUIPMENT.

### ARTILLERY.

There is too much artillery for the number of infantry in our naval landings. Artillery to be effective requires a large number of men, many more than are generally allowed. Twenty-four men is the least number that can render a 3-inch B. L. R. effective in active service; twenty, the least number to man a Gatling, if properly supplied with ammunition. The service allowance of ammunition carried with guns is small, and would be exhausted in a short time in action. More ammunition and fewer guns should be provided. It is true that most of a gun's crew are armed as riflemen, but in order to make the gun useful and to secure it against capture these men must operate close to it. A man in a gun's crew cannot carry his personal arms and equipments in addition to ammunition for the gun. All of the gun ammunition must be carried on wheels. A limber is very necessary for all guns intended for use in the field; it is the only way to carry the necessary supply of ammunition. The wheels of the B. L. R. limber should be exactly like those of the gun. The Gatling limber should always be used with its gun, and as it is similar to the carriage it may be used to replace it in case of a breakdown. I would call attention to what I consider deficiencies and to make certain suggestions for their amelioration. The ammunition boxes on the carriage of the B. L. R. frequently jam. There is no provision made in the box for carrying cartridges, five projectiles have to be left out of each box to accommodate them. The limber should carry three boxes exactly similar to those of the carriage, so that they could be interchanged. There should also be a box of small-arm and revolver ammunition. The spare article box should be entirely done away with and the articles now carried in it. together with those carried in the quarter-gunner's haversack, should be stowed in a locker contrived between the cheeks of the trail of the piece. A fuse for each projectile should be carried in the ammunition boxes. A double supply of primers should be packed and carried in the same way. This would insure all the requisites for efficient service being found together. The tires of the wheels should be broader or sand tires should be supplied. The drag rope should be double, without toggles, and should reel up under the tongue of the limber. A few armorer's tools should be added to the spare articles, and many of the spare articles now carried with the piece should be placed in a reserve box to be kept at the base. Two axes and two spades should always be attached to the piece and limber.

Cannister should be supplied for the B. L. R., and a proportion of multi-ball cartridges for the Gatlings.

The number of passing boxes should be reduced to four, and these should be attached to the piece when not in use. The length of the sponge handle should only exceed that of the bore by 12 inches. The rammer-head should be entirely removed. A better system of carriage brake is very much needed. It is very well to say that they should be properly tended and if properly tended will work well, but a long experience, at times with the most intelligent crew we can ever expect to have, proves that they frequently jam. The ranges, times of flight, &c., should be engraved upon a piece of brass permanently attached to the gun, and the officers of the guns and petty officers should be provided with similar tables printed on rubber cloth. Had it not been that one officer happened to burden himself with our Ordnance Instructions we should have been entirely deprived of this necessary factor of accurate fire. It is true the sight is well marked, but more is needed. A dummy primer should accompany each piece for drill purposes. An India rubber blanket of sufficient size to cover the entire carriage, and another for the limber should be secured to each vehicle.

All carriages and boxes should be painted the regulation brown, and no deviation should be allowed in this respect on board of sea-going ships. Scraped and white carriages are unserviceable, and other fancy painting mars the uniformity of pieces when brought together. The guns themselves should be kept as issued.

The present light artillery tactics should be altered so as to complete the drill for guns with limbers if they are adopted, and to correct the faults in equipment already mentioned. A pot of axle-grease and a small can of oil should be added to each gun's equipment.

A great improvement in the 3-inch B. L. R. would be the adoption of a metallic cartridge. A telemeter or some better means of measuring ranges should be provided for officers commanding artillery, and all artillery officers should be required to carry a good field-glass.

### SMALL-ARMS.

*Rifles.*—The rifle supplied was the Lee magazine rifle. As a general thing the arm stood the wear and tear of service in the hands of men who had never seen it before exceedingly well. One or two springs gave out, but were easily replaced. There were some defects which could be remedied in future issues. The sights are too sharp, cutting the men's hands in use. They should be covered with sight-aprons. A baize bag should be provided for the piece when stored aboard ship or transported in boats. This bag would protect the piece very much on such service as this expedition. Good serviceable sling straps should be provided with each piece and the upper end secured further down the barrel; the lower end should be secured on the butt; when slacked off this strap would not interfere with the magazine, and would render the carrying of the piece, when slung, much easier. Should it be proved that the sling thus placed interferes too much with the magazine it might be placed on the side of the piece instead of under it. The magazines are too flimsy, several gave out in the brazing and the springs of some became upset and useless. The lower part of the magazine should be corrugated to give a grip for the hand. There should be a double action for the magazine; pushing it in half way should attach it to the piece; a second push or a longer one in the first place should unlock it and open the feed. There should be a thumb-piece on the firing-pin instead of a button, which is liable to slip through the fingers and fire the cartridge prematurely. The method of half-cocking the piece given in the pamphlet directions was found to be too dangerous for use.

The following was substituted: The piece was dropped muzzle down and held under the right arm. The left hand was carried across the body; the left hand seizing the button between the thumb and forefinger, palm of the hand to the front. A slight pressure was exerted with the left hand towards the body at the same time the fore-finger of the right hand was carried to the trigger and pressed against it, the firing-pin being eased into the safety-notch with the left hand. The men discovered a quicker, but perhaps more damaging way of half-cocking; they raised the bolt, slightly pressed the trigger; the pin stopped in the safety-notch and the bolt was then turned down. The pamphlet requires the muzzle to be raised to a vertical position in "in" and "out magazines;" this causes the right hand to be in a very awkward position for pressing on the catch-trigger. It was found more convenient to keep the piece in the ordinary position of load.

A manual of arms suggested by Commander McCalla, which embodies the level trail authorized in the Light Artillery Manual, was used for the riflemen, and met with complete success; it was considered by every one as far superior to the manual of arms now authorized. Similar manuals are used by all of the great military nations of Europe. The "order arms" was the basis instead of, as at present, the "carry." All positions now set down in the manual were reached directly from an "order." Dressing and facing were performed at an "order," the man simply raising the butt of the piece from the ground. At the order "forward march," the man took up the position of "trail arms." This "trail" differed from the "trail" now authorized in that the barrel was horizontal and the piece balanced in the right hand. For the "support" now authorized the old heavy infantry "shoulder arms" was substituted, that position of the left arm being easier with the bolt gun. A "slope" was adapted from the "support," the barrel being simply inclined to the rear, the left hand and butt advanced. The "secure" was the position in which sportsmen usually carry their pieces under the right arm, barrel up, right forearm and hand carried across the stomach. It was found that the men picked up this manual much quicker than the old one, and liked it much better in every way. One of the magazines carried in the belt should be filled with multi-ball cartridges. Every piece should be distinctly marked with its number in large figures on the butt. The figures to be sunken, if possible, and filled in with some bright-colored paint. The bayonet as at present issued is excellent, and should not be done away with or altered.

*Revolvers.*—The present revolver is not adapted for the necessities of our service. It is too long, the ejecting apparatus is very poor and slow, the thumb-piece on the end of the ejector is a great inconvenience, catching in the holster and clothing. The butt is badly shaped. For the officers, at least, a self-cocker is required. A revolver, if used at all, is going to be used quickly and at close quarters. A .45 caliber revolver similar to the new Smith & Wesson Russian model, .44 caliber, would seem to be the best. All revolvers should be nickel-plated. The ammunition should be multi-ball.

*Swords and cutlasses.*—Swords and cutlasses appeared to be of no use except as a badge of office. A much less cumbersome badge would be a handsome revolver and cross-belt, with a holster for a field-glass attached. For *service* and *service dress* the sword should be *abolished.*

### EQUIPMENTS.

*Cartridge belts.*—The general idea of the present new cartridge belt is correct. The hooks should all be done away with. The buckles on the shoulder supports should be of better make. The belt should be made to overlap and secure with straps at the left side. This would bring more cartridges in front, where they are most needed, and would insure a better fit. The belt was much liked by the men, although all were prejudiced against it at first. No complaints were heard when 80 rounds of ammunition were carried for several days. Men constantly slept with their belts on, and lay on their backs without difficulty. The shoulder supports should be a little stiffer, as they become creased and do not look neat. The bayonet-frog, and scabbard should be hung on a light strap to be worn around the waist under the cartridge belt. The frog never comes in proper position as worn now. The light belt would permit the carrying of the bayonet for drill and fancy duty. There should be several sizes of belts; one very much larger than any made now. Three belts out of eighty-eight had to be transformed by ripping off the eyelet straps and riveting their bitter ends to the end of the belt webbing. In these cases no cartridges appeared in the front. Each belt should be distinctly marked on the inside with its maximum and minimum length. On the outside, in large figures of bright color, its number. This would prevent much confusion and fix the responsibility of possession. This remark refers to every article of the outfit. On the expedition it was found necessary to scribble the owner's initials on the outside of everything. Not a neat method, to say the least of it.

*Haversacks.*—Good, but economy must have dictated the omission of the mess-gear intended to fit in this article. The marines who had the same haversacks properly supplied were comfortable; our men were constantly in trouble about their mess-gear, if they were fortunate enough to have any. A cup of proper shape and provided for in the storage would have been an addition even to the marine's outfit. There should be no tie-ties and make-shifts in a complete equipment; every thing should have its place provided for it and should be of exactly the size to fit. A small tin for pepper, salt, sugar, coffee, and pickles would have added to the comfort of our men. The strap is too heavy.

*Canteens.*—The canteen is good; the strap unnecessarily heavy. Some canteens were found to be leaky. An air test would discover this defect when they are inspected for acceptance. Like the cartridge belt and haversack the canteen should be distinctly marked with a number. These numbers should be the same for all of the articles of one man's equipment and should be on the outside at the most visible point.

*Blanket bags.*—Neither useful nor ornamental. A bag with one compartment and a good flap, wider and not so deep, would have been much better, and should be provided for future work. This is important, as they would be of much use. The marines were far more mobile and more comfortable than our men.

*Color of equipments.*—The mouse colored equipments now used become quickly soiled; the light red ones of the marines equally so. All canvas work should be tan-color. This tanning preserves the canvas, always looks clean, a fact that was easily observable, as some of the men and officers had tan-colored canvas shoes; is cheap, can be reproduced by dipping in a division tub of tan mixture. The leather should be of the same shade.

*Clothing.*—Blue flannel and cloth carried off the palm for comfort and wear. The men complained of the heat whenever put in white, and were glad to get in blue again. Flannel is the healthiest for the climate of Central America and the Isthmus.

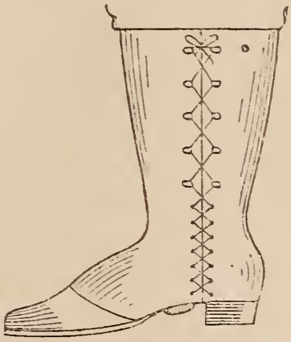
*Blankets.*—For the work we were called upon to perform a gray blanket would have had a more cleanly appearance than the white ones carried.

*Blankets, rubber.*—A rubber blanket should be kept and issued with every set of equipments. They are invaluable night and day, forming a rain coat, bed, tent, and bed cover.

*Head gear.*—The straw hats bought in New York were invaluable. It is thought that the new canvas hat adopted for the Navy will be equal to them, and will have the advantage of cleanliness and shapeliness. Straw hats soon get very dirty and if wetted once lose their shape. For extended shore service the hat (regulation) should be dipped in the tanning tub.

*Corps badges.*—In order to distinguish the men and officers of the batteries corps badges were adopted and found very useful. The men were able to find their own officers although they did not know them personally, and every one could tell just where the men belonged. The badge was of red flannel or serge about an inch and a half in size. They were worn on the front of the helmets, straw hats, and blue caps. A ◇ (diamond) for the rifle battery and a △ (triangle) for the Gatlings. The guidon flags of the batteries were similarly marked, and if time had allowed and the conveniences been at hand every article of equipment and armament would have been similarly marked.

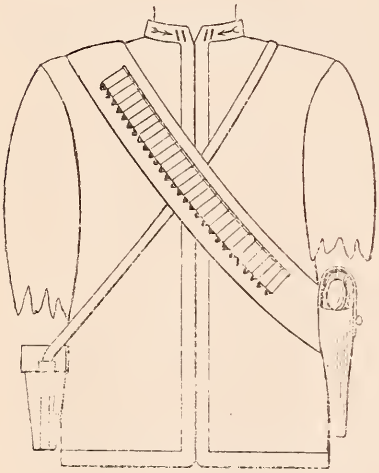
*Leggings.*—As provided, bad. Leggings should be made of tan-colored canvas. The white duck ones provided were too flimsy and too visible at night, and were easily soiled. They should be cut by an expert, and



made to fit well over the shoe, one size for each size of shoe issued. This would assure a neat fit over the foot and ankle. The calves of men's legs differ, of course, in size for the same sized foot. This should be provided for by making the pieces overlap very much at the top. The ankle part of the opening to be secured by loops, the calf part by a lacing with hooks. The leggings, as provided, were too long. If they are properly made and thick enough to be serviceable, they will keep themselves in position.

*Officers' clothing and equipments.*—A dark blue flannel shirt, similar to that ordered for petty officers, first class, in the new regulations, should be made part of the uniform of officers when in service dress for expeditionary service. The helmet and leggings should be tan-color. The leggings to be the same as those heretofore suggested for the men. It is probable that the new hat adopted for enlisted men will prove a substitute for the present helmet. The strictly regulation helmet is waterproof, and can be wetted and scrubbed without injury. Those of inferior make are injured by wetting, and soon become misshapen and very dirty.

As previously stated, the sword and belt should be entirely withdrawn in service dress. In lieu thereof, the best revolver obtainable, all to be uniform in make and calibre with those of the men, and a canvas cross-belt, fitted in front with thimbles for cartridges, at the side with a holster for the pistol, and behind with a case to contain map, writing materials, telemeter, compass, &c. A fine field-glass should be slung across the other shoulder. On service the haversack, canteen, and blanket bag should be worn by officers, and unless bags and hammocks are carried no extra baggage should be allowed. When officers can provide their own transportation, they will find a tin wash-basin and a canvas stretcher cot, such as are made for hunting and sold for $2.50 by sporting dealers and outfitters, to be of great additional comfort.



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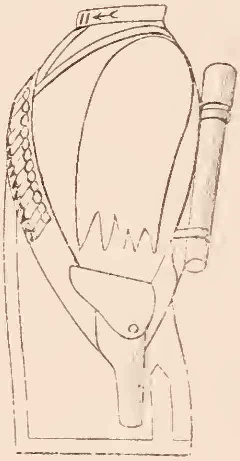

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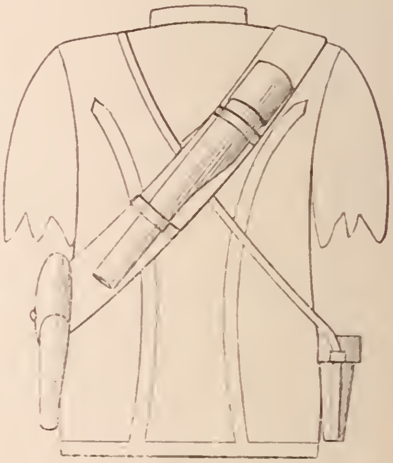

Rear.

*Intelligence map.*—Each officer should be provided with a good intelligence map of the country in which he is to operate. These maps should be prepared by the Office of Naval Intelligence, and printed on rubber cloth. On the cloth side should be printed such intelligence, notes, and data as may be thought of possible use.

*Note-book for field service.*—A small note-book for rolls, arm and equipment list, with proper printed headings and columns ruled; a few leaves arranged to be detachable with stubs, ready to be filled in for requisitions, receipts, and invoices; a few leaves for accounts, a space for a short journal, and for abstracts of orders received and issued. The book to be stoutiy bound in a water-proof cover, and provided with a good pencil with India rubber end. It is useless to order these things to be provided by officers. The Government should manufacture or purchase all these articles of outfit, and issue them to officers, or they will never have them when needed. The components of the Navy ration should be given in this book, also methods of treating ordinary diseases and accidents.

*Provisions.*—The new Navy ration worked admirably. Had the directions in regard to half barrels and exact number of rations in packages been carried out, it would have been more convenient. Sausages similar to those issued to the German army, each containing, say, five days rations, and marked on the side of the cover with a scale to show rations and one-third rations, would have been very convenient, and would also be a valuable addition to a ship's stores for any detached service, whether afloat or ashore.

*Provisions.*—The present methods of issuing provisions to the men will never do on active service, and must be modified. Men were often in want of articles of which there was an abundant supply in the hands of the paymaster, and when they were issued they came in quantities and shape perfectly unmanageable. A barrel of pork once opened is an ugly customer to transport, and as for a barrel of flour, sugar, or beans it is a simple impossibility. These articles should be put up in very much smaller packages.

On service the field force should never be called upon to handle stores before they are issued to them individually. It is mere laborers' work, and can be much better performed by that class of people, especially in a bad climate where they have the advantage of being acclimated.

*Cooking facilities.*—The boat stoves were excellent, and with the addition of a temporary fire for a camp kettle, were found fully capable of preparing food for fifty men each. In each boat stove box a couple of hatchets should be packed.

A nest of kettles should be provided instead of several kettles of the same size. By this method enough kettles for use as water buckets, &c., could be carried in the space required for one mess kettle.

Stoves and kettles should be distinctly marked with the corps badge or name of the detachment to which they are issued.

*Camp gear.*—Tents and sentry shelters in moderate numbers should be supplied to all expeditions. It would seem that much room in stowing could be saved by using iron piping for poles instead of wooden ones, and iron pins for tent pegs. Tanned canvas would look cleaner after short service than white, and would be less apt to mildew.

Axes, hatchets, brooms, rakes, hoes, buck-saws and bucks, lanterns, and buckets should be provided in fair quantities.

A condensing apparatus should be kept ready for similar expeditions.

A supply of spades, picks, and shovels should accompany every expedition, to be issued as required. The bugles should be the same as those issued to the marines. They are now inferior in make and of a different key.

*Weights carried by men.*

RIFLEMAN.

| | Pounds. |
|---|---|
| Waist belt with bayonet and 80 cartridges | 11.50 |
| Haversack, two day's rations complete | 4.50 |
| Canteen filled with water | 4.00 |
| Blanket and rubber blanket with underclothes | 9.50 |
| Rifle | 9.00 |
| Pot, pan, and spoon | 75 |
| | 39.25 |

CANNONEER.

| | |
|---|---|
| Waist belt, revolver, cartridge-box, and 20 rounds of ammunition | 4.50 |
| Haversack, two days' rations complete | 4.50 |
| Canteen filled with water | 4.00 |
| Blanket, rubber blanket, and underclothes | 9.50 |
| Pot, pan, and spoon | 75 |
| | 23.25 |

MARINE.

| | |
|---|---|
| Rifle and accoutrements, haversack complete, canteen full, clothing-bag packed, and 80 rounds of ammunition | 53.00 |

## SUGGESTIONS.

Concentrate the personnel and everything referring to their organization, drill, equipment, conduct, &c., under one head.

Concentrate the enlisted men waiting for ships at one *barracks*, and drill them thoroughly as infantry and artillery. They will all know enough seamanship to start with when they go aboard ship, and their great gun and other drills can be given them in the service.

Have always ready, say at New York, a complete expeditionary equipment for 1,000 men, issuing part of it every summer to the North Atlantic squadron for an encampment on some part of the coast.

Refer the whole matter of the selection of this equipment, and the preparation of a proper manual for all arms, to a board of officers.

# LANDING

OF THE

# NAVAL BRIGADE OF NORTH ATLANTIC SQUADRON

FOR

# INSTRUCTION

ON

# GARDINER'S ISLAND,

AUGUST, 1884.

# REPORT ON ENCAMPMENT OF NAVAL BRIGADE OF NORTH ATLANTIC SQUADRON, AT CAMP MILLER, GARDINER'S ISLAND, AUGUST 11-14, 1884.

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The North Atlantic Squadron, under the command of Rear-Admiral S. B. Luce, left Portsmouth, N. H., on the 6th August.

It was generally understood that the vessels were en route to Newport, but on the afternoon of the 8th instant, Captain Miller, commanding the Tennessee and Chief-of-staff, received an order to proceed to Gardiner's Bay, where the ships were to be moored, and to land the naval brigade for an encampment of three days.

The vessels were accordingly moored about 9 o'clock on Saturday morning, the 9th. Officers were sent to select a site for the camp and to obtain the necessary permission to land from the proprietor of the island, Mr. Gardiner. At the same time the following memorandum of instructions was sent to each vessel. Capt. J. N. Miller was appointed to command the brigade and was charged with the arrangements for landing.

### MEMORANDUM.

1. The landing will be as if unopposed, and provision will be made for an absence of three days.

2. The force to be landed from each vessel will be that indicated by Squadron General Order No. 9.

3. The tents, provisions, and other heavy articles will be landed with the marines from the Tennessee as a guard before the main body lands. After the brigade is landed the boats will be towed back to the ships by the steam launches, leaving one whaleboat from each vessel at the beach.

4. Unless otherwise directed, the brigade will be ready to embark from their ships at 7.30 a. m., on Monday, August 11.

5. Each vessel will provide shelter for her own landing force (keeping the infantry companies separate from the artillery sections), utilizing sails, awnings, and spars, for the construction of tents. Stakes for side stops and guys for tents will be provided before landing.

### COMMISSARIAT.

Each vessel will be prepared at the time designated to land cooked pork packed in barrels, bean soup in kettles, and bread in bags, sufficient for its men for one meal. The commissary will provide all other supplies for the command.

### AMBULANCE CORPS.

The ambulance corps will consist of one surgeon and one assistant surgeon, as detailed.

The apothecaries and stretchermen required by General Order No. 9 will be detailed by the commanding officer. The fleet surgeon will superintend the medical outfit.

### OFFICERS' OUTFIT.

Officers will wear service dress with caps, leggings, and side-arms. One change of clothing and blankets, rolled in a hammock as prescribed, will be carried.

Transportation for 10 pounds of baggage will be provided for each officer.

### MEN'S OUTFIT.

The men will wear blue with underclothing, leggings, and knives. They will carry, rolled in a hammock blankets, one change of clothing, and a supply of tobacco.

They will carry their pots, pans, and spoons slung to their waist-belts on the left side.

### MARINES.

The marines will wear fatigue uniform and caps, will carry overcoats and blankets, and in their knapsacks, undress coats, trousers, and change of underclothes.

### HAMMOCK ROLLS.

The hammocks, without clews, containing change of clothing, blankets, &c., are to be rolled along their lengths, tied with five stops, and the ends tied together; to be worn over the left shoulder, with the ends resting on the right hip.

### COOKING AND MESS ARRANGEMENTS.

It is intended that the brigade shall depend upon its own resources for subsistence and cooking appliances. The stores will be landed in advance of the brigade, together with the heavy articles.

[Here followed a tabulated form distributing the stoves, cooks, mess cooks, &c., together with directions as to the articles to be carried and furnished by the cooks.]

Cooks and mess cooks will land with their scouse-kettles, mess-kettles, and other articles at the same time that the provisions are sent on shore.

The quartermaster will be in charge of the transportation service, which will consist of all the cooks and mess cooks, servants, and such men as may be detailed.

There will be but two messes for all officers.

### AMMUNITION.

All the marines and infantry men will carry their cartridge boxes filled. The packages of ammunition are not to be broken or opened unless ordered.

The ammunition boxes of each B. L. R. are to be filled with 20 charges of powder, 10 rounds of shell, and 10 of shrapnel; projectiles to be filled and plugged; spare article boxes to contain the fuses for the above, and all spare articles.

The caisson boxes of the Gatling guns will be filled with ammunition.

The Vandalia and Yantic will land their Gatling gun-carriages, without the guns or caisson boxes, to be coupled and used as a transportation wagon.

Lieutenant Belknap, of the Vandalia, will have charge of the landing of stores and provisions on the beach, and will turn them over to the quartermaster.

The organization of the brigade was as follows:

Capt. J. N. Miller, U. S. N., commanding naval brigade.

*General staff.*—Lieut. C. E. Colahan, adjutant-general: Pay-Inspector J. H. Stevenson, commissary; Surg. T. N. Penrose; Passed Asst. Paymaster C. W. McGowan, quartermaster; Lieut. R. Wainwright, military engineer; Ensign H. Eldridge, secretary; Naval Cadet R. Welles, aid; Naval Cadet C. W. Hazeltine, signal officer.

*Marine battalion:* Capt. J. M. T. Young, U. S. M. C., commanding; first company, Lieutenant Goodrell; second company, Lieutenant Gulick; third company, Lieutenant Bates.

*Infantry battalion of seamen:* Lieut. R. P. Rodgers, U. S. N., commanding; Lieut. R. T. McLean, adjutant; first company, Lieut. W. W. Kimball; second company, Naval Cadet W. L. Capps; third company, Naval Cadet Littlehales; fourth company, Lieut. John Downes; fifth company, Lieut. S. C. Paine; sixth company, Lieut. G. H. Peters; seventh company, Lieut. York Noël; eighth company, Ensign F. R. Wall; ninth company, Ensign J. T. Newton; tenth company, Lieut. Alfred Reynolds.

The first, second, third, and fourth companies were from the Tennessee; the fifth and sixth from the Vandalia; the seventh and eighth from the Swatara: the ninth from the Yantic, and the tenth from the Alliance.

*Artillery battalion:* Lieut. T. T. Wood, U. S. N., commanding; Ensign W. S. Sims, adjutant; first platoon, Lieut. M. F. Wright; second platoon, Lieut. H. Hosley third platoon, Lieut. F. E. Sawyer; first section, Naval Cadet Ellicott; second, Naval Cadet Hulme; third, Naval Cadet Stout; fourth, Naval Cadet Palmer; fifth, Naval Cadet Seymour; sixth, Ensign Mayo.

The battery consisted of four 3-inch B. L. R's, from the Tennessee, Vandalia, Alliance, and Yantic, and two Gatling guns, from the Tennessee and Swatara.

Passed Assistant Paymaster Barry and Asst. Surg. T. C. Craig were detailed as assistants to the commissary and surgeon.

The following is a summary statement of the brigade:

| | | |
|---|---|---|
| Staff | | 9 |
| Marine battalion: | | |
| Officers | 4 | |
| Men | 99 | |
| | | 103 |
| Infantry battalion: | | |
| Officers | 20 | |
| Men | 352 | |
| | | 372 |
| Artillery battalion: | | |
| Officers | 13 | |
| Men | 117 | |
| | | 130 |
| Pioneers: | | |
| Officers | 1 | |
| Men | 15 | |
| | | 16 |
| Commissary department: | | |
| Officers | 1 | |
| Men | 6 | |
| | | 7 |
| Medical department: | | |
| Officers * | 2 | |
| Men | 7 | |
| | | 8 |
| Signal corps: | | |
| Officers * | 1 | |
| Men | 2 | |
| | | 2 |
| Buglers | | 4 |
| Officers' cooks and servants | | 9 |
| Total | | 660 |

The site selected for the camp was in all respects excellent, whether from a sanitary point of view, its proximity to the landing-place, or for the immediate object of the encampment—drill. (See Plate XI.)

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* One already counted on staff.

It was somewhat back from a bluff about 100 feet high, on the northwest end of the island; its soil was sandy, though well covered with sod; its surface was perfectly drained, and its surroundings furnished available space for the manœuver of a large body of men.

Its only drawback lay in the fact that good fresh water was not to be found in its vicinity. On this account it became necessary to supply the camp with water from the ships, which entailed an additional labor.

The beach upon which the landing was to be made was about 2 miles from the ships, and but a third of a mile from the site chosen for the camp.

Monday began with rain so that the landing was delayed; but shortly after 8 o'clock the rain ceased, signal was made to land the heavy material, and by 11.30, the boats having returned, the brigade was on its way to the beach.

A company of marines embarked at the first as a guard over the material landed. Upon the arrival of the brigade at the camp ground this company became the guard of the day, and sentinels were posted from it.

After the first day all the guard duty was performed by the bluejackets.

Owing to the lack of sufficient means of transportation (but two teams could be procured) much of the material for the construction of tents was not on the ground at the time of the arrival of the brigade at the site of the camp. The tents were all up, however, at 2 o'clock; the men had had their dinners, which had been brought on shore as indicated in the memorandum of instruction, the kitchens were ready for use, the latrines had been prepared, and trenches dug around the tents.

After this meal, which had been cooked on board ship, rations were drawn from the commissary and all food was cooked at the camp kitchens.

Later in the afternoon the company and battalion parades were assigned, and the following routine published:

### DAILY ROUTINE.

5 a. m. Reveille. Outer line of sentinels called in; coffee; march to bath.
7 a. m. Breakfast.
7.30 to 8 a. m. Police camp.
8 a. m. Sick call.
9.30 a. m. Drill call and assembly; target practice with small arms.
11 a. m. Recall from drill.
11.30 a. m. Serve out dinner to cooks.
12 m. Dinner.
1 p. m. Police camp.
2.30 p. m. Battalion drill; target practice with B. L. R. and Gatlings.
4 p. m. Recall from drill.
5.30 p. m. Call for parade.
6 p. m. (or after parade). Supper.
At sunset outer line of sentinels posted.
9. m. Tattoo.
9.15 p. m. Taps.

The pioneers, with details from the battalions, under the direction of the military engineer threw up two light earthworks, in which the pieces of artillery were placed for the defense of the camp.

The general arrangement of the camp is shown in the accompanying plan. (Plate XI.)

The infantry battalion of seamen camped in column of divisions, with one tent to each company; the officers' tents being on the left flank opposite the division streets.

The tents of the marine battalion were in one row, in advance of the infantry battalion.

The artillery were camped on one street with tents on each side of it. The guns were parked in the street when not placed in the earthworks.

The kitchens were on the right flank of the camp of the infantry, and the latrines were on the same flank close to the bluff.

In the construction of tents the awnings, sails, light spars or capstan bars were used. The different forms and sizes of this material caused some variety in the appearance and proportions of the tents, and somewhat impaired the regularity of the camp lines.

The general design of the tents were as follows: Capstan bars or boat's masts were used for the end uprights, to which was lashed a boat's strongback cr stun'sail boom as a ridge pole. An awning or sail was then middled over the ridge pole, and the tent raised. The uprights were sunk in the ground about a foot and well guyed to the front, rear, and sides. The leaches were hauled out to the pegs, and the ends of the tents were then closed with boat or other light sails. A shallow trench was dug around each tent to afford drainage.

The camp was now organized. After supper the long roll and call to arms were sounded and the brigade formed to resist attack.

## DRILLS.

The hours assigned for drill were spent by the infantry battalions at battalion or company drill, principally the former. Much attention was given to skirmishing and the methods of attack, and the movements of the battalions were as a rule executed in a very creditable manner.

Companies were detailed for target practice, which was carried on throughout the day.

The artillery were exercised at the school of the section and battery, and at target practice with the B. L. R.s and Gatling guns, all of which were very instructive.

Thus there were two drills each day of an hour and half's duration in addition to the brigade parade. which was also instructive as in the formation of the brigade the men were manœuvered by battalions. Three days of such work gave the men an understanding of manœuvers which instruction on board ship, however careful, could never accomplish.

## COOKING ARRANGEMENTS.

The regulation boat stoves gave much satisfaction, although more was required of them than should be demanded. Each stove cooked the food of 70 to 90 men. The ration to be cooked consisted of coffee, rice, potatoes, fresh meat, salt pork or canned meat, and tomatoes. The food was, as a rule, well prepared, but in order to provide for so large a number it was necessary to cook twice; that is, as much of the meal as the stoves could cook was prepared, placed to one side, and the remainder cooked before the meal. This was inconvenient, and necessitated the consumption of more fuel and labor.

A stove should be allowed for every 50 men. For this number of men the regulation stove can properly and conveniently cook any ration which may be issued. With it broiling, boiling, and frying may be done. The daily consumption of cord-wood is about four or five sticks. Ordinary camp fires were also used for various purposes, particularly for keeping hot that portion of the food first cooked.

At reveille on the morning of the 14th the men rolled their kits, had coffee, and began to break camp. When they went to breakfast at 7 o'clock all the tents were down, and all the material, except the stoves, which were in use, were ready for removal. At 7.30 four teams arrived for the quartermaster's work, and by 8.45 the camp was clear of all material and cleaned. The teams hauled the heavier articles and the men shouldered the spars and lighter material.

In re-embarking, the reverse of the programme for landing was observed, and after the boats had discharged the *matériel* at the ships and were on their return to the beach, a brigade parade was held, and the command marched to the beach, where it embarked, reaching the ship at 12.30.

The encampment of a naval brigade of 660 officers and men for three days was of a nature before unknown in our service; in fact, it is doubtful if so large a body of men-of-war's-men have ever served together on shore for so long a time (the Franco-German campaign excepted). It becomes, then, a subject of criticism and offers a fit opportunity to notice deficiencies and to draw lessons from the experience thus afforded.

The lack of equipment for a landing force from our ships became most apparent in making the preparatory arrangements for this encampment. The want of haversacks and canteens made it necessary to have food and water upon the ground before or on the arrival of the men, thereby hampering the transportation service. [Considerable advance has been made in the matter of equipment since this report was written.] This consisted of two teams hired for the occasion, one cart made of two Gatling-gun carriages, and details from the command. The difficulties encountered made most noticeable the necessity of providing proper means of transportation before undertaking operations on shore instead of trusting to improvised carts and material found on board ship.

The equipment for the carriage of a suitable amount of ammunition was most defective. Owing to the present (then) style of cartridge boxes (Hitchcock and Navy) each infantry man could carry but 20 rounds of ammunition without breaking the packages, although if this had been done the men from the Tennessee might have carried 40 rounds. But 40 rounds with little or no reserve ammunition is a very meagre supply for a man armed with a magazine rifle. [This has been remedied in the new allowance.]

The caisson boxes of the 3-inch B. L. R. contained 20 rounds of ammunition, and the Gatlings were supplied with 920 rounds packed in feed cases in their boxes.

No ship in this squadron is supplied with a boat carriage for the B. L. R. For boat operations then the old 12-pdr. howitzer must be used. Comment on this is needless.

But one cart (referred to in the memorandum of instructions) could have been made from the material of this squadron for the transportation of reserve ammunition.

Considering the variety of forms and the sizes of the canvas used and the fact that these could not be in any way altered, the tents were probably as good as could be devised under the circumstances.

Their size rendered it difficult to make the sides taut, so that in heavy rains they would probably not have shed the water well, and their considerable weight made their transportation and construction difficult and slow.

### HAMMOCK ROLLS AND INTRENCHING TOOLS.

The hammock rolls proved a most awkward make-shift. It was necessary to provide some means of carrying the men's blankets and clothing, as well as to give them something upon which to lie. But the rolls were very stiff and uncomfortable and were not suitable for carrying a proper supply of clothing.

Haversacks, canteens, and means for properly carrying clothing, should certainly be provided.

The intrenching tools were not well adapted to, and were insufficient for, the end desired. In these days of precise and destructive fire-arms the supply of tools for hastily providing cover should be well considered.

Such were the chief defects noted. They were defects certainly vital, due to the utter lack of equipment, and so apparent that they may serve to induce the Department to appoint a board to consider the subject of the proper equipment of the landing forces of our vessels.

This equipment should be such that each man might be enabled to carry his arms and ammunition, means for providing cover against fire, his water and ration, his shelter and clothing, and yet not destroy the mobility of the force.

A naval brigade should possess great mobility, consequently shelter-tents only should be provided to shelter the men. Should the brigade go into a permanent encampment suitable means could be provided which would be adapted to the circumstances.

Having drawn attention to the deficiencies it becomes the more agreeable duty to enumerate the many good points observed.

The camp was well kept and policed; the guard duty was well performed by the blue-jackets, who quickly appreciated the responsibilities of the position of the sentinel and promptly fulfilled all of the duties; the spirit and conduct of the men were excellent, and the battalion and skirmish drills, the artillery and Gatling practice, were alike creditable to officers and men. In fact, had the encampment lasted a week instead of three days, it is probable that the brigade, as far as its *personnel* was concerned, would have been in good condition to have undertaken any operations for which they might have been called upon in time of war.

It was noticeable that the sergeants and corporals chosen from the petty officers and leading men performed their duties intelligently and with force, and that the men in general soon understood the intention of the manœuvers, and adapted their movements to the accidents of the ground and obstructions, and to the plans of attack and the value of cover.

Another fact was apparent. The men who were most distinguished as seamen were as a rule most prompt and exact in their duties on shore.

It is well for naval officers to realize that the preparation, equipment, and uniform organization of our landing forces are among the most important subjects to which they may give their attention, having in mind that such detachments have been landed at short notice in the ordinary times of general peace to protect American interests abroad, and are liable to be called upon for more serious operations near the sea-coast to enforce the Government's demands upon states or tribes which listen to no other argument than force.

This encampment was organized and undertaken upon the short notice of two days (one of which was Sunday). The experience gained was most valuable. It has accentuated our shortcomings, the necessity of equipment, and the fact that the naval brigade, if properly conducted and equipped, is capable of important operations on shore. If, as is to be desired, each succeeding summer may furnish an opportunity for like manœuvers, it is hoped and may be expected that in the course of a few years we may be in position to land, whenever called upon, a force in all respects prepared for any military operations which seamen may be called upon to perform.

# SHIPS.

## ENGLAND.

### THE RENOWN AND SANSPAREIL.

The first of these ships is being built by Armstrong, Mitchell & Co. and the second by Samuda Bros. The specifications were issued by the Admiralty in March, 1885, and there may be slight changes in them.

These ships are the largest laid down for the English navy since the Inflexible, twelve years ago, and are to be finished in three and one-half years. They are to cost £640,000 and £601,000, and will be of the following dimensions: Length, 340 feet; breadth, 70 feet; draught, 27 feet 3 inches; displacement 10,470 tons. They will be of steel, with longitudinal framing, double bottoms, and transverse water-tight bulkheads; will have ram bows of unequaled strength; five above-water torpedo ports and four below-water.

There will be two 110-ton B. L. R's in a single turret on the main deck, with a range of fire from ahead to 60° abaft the beam. The upper and spar decks are partial, not extending as far forward as the turret. On the upper deck twelve 6-inch B. L. R's are mounted in broadside, and on the spar deck is an 18-ton 9.2-inch gun mounted on a turn-table as a stern-chaser. There will also be many machine and rapid-firing guns and Whitehead torpedoes. The turret, breastwork, protecting turret gear, and water-line belt amidships, will have 18-inch steel-faced armor and the transverse bulkheads at the belt ends will have 16-inch armor. The midship citadel thus formed is roofed over by a 3-inch armored deck, and 3-inch armored decks reach from the lower edges of the citadel to the extremities. The 6-inch batteries are protected at their ends by 6-inch steel-faced armor screens, by 3-inch traverses between the guns, and by 3-inch armor on the sides—the 3-inch armor being in three thicknesses of ½-inch and 2-inch plates. There is an armored loading tube (2-inch) for the stern-chaser. All backing will be of 6-inch teak except that of the 6-inch screens, which will have 10 inches of teak. The armored pilot towers will weigh 80 tons.

The ships will be driven at an estimated speed of 15.5 knots by twin screws with independent engines of the vertical inverted three-cylinder type, the stroke of piston to be 4 feet and the cylinder diameters 38, 58, and 88 inches for the high, intermediate, and low pressure cylinders; the aggregate I. H. P. to be about 8,500, and the revolutions 95. Steam of 130 pounds will be furnished by eight boilers of Siemens-Martin steel, with a forced draught of 3-inch water pressure.

### THE BENBOW.

The Benbow is one of the Admiral class; was laid down in November, 1882, launched in June, 1885, and will be ready for service about the spring of 1887. The following are her principal dimensions: Length, 330 feet; breadth, 68 feet 6 inches; draught, 27 feet 3 inches; displacement, 10,050 tons.

She is a steel armor-belted, barbette-turret, twin-screw ram. She has about two hundred water-tight compartments so arranged that practically she has three skins as high as the main deck.

Although very much larger the installment of her armament is much like that of the Boston and Atlanta. She carries two 110-ton 16¾-inch B. L. R's in barbette towers, one at each end of the ship, on the main deck. These guns have arcs of fire of about 270°. With 900 pounds of powder they throw an 1800-pound projectile with a velocity of 2,020 feet, giving an estimated energy of 61,000 foot tons, about twice that of the 80-ton guns, and will be the most powerful guns existing; Krupp's 119-ton gun will have only 46,000 foot tons of energy. Between the barbettes is a battery of ten 6-inch guns, also on the main deck. The extreme guns of this battery have ports enabling them to fire fore and aft as well as on the broadside. On the spar deck, which extends between the barbettes, are eight 6-pounder rapid-firing guns mounted in broadside with ¾-inch shields attached to their carriages. In half-turrets on the bows are two machine-guns, and four more are on the quarters. There will be a .45-inch Nordenfeldt at each corner of the spar deck and eight Gardner guns mounted on the armor screens which protect the 6-inch battery from raking fire. The single military mast will also have two machine-guns in the top. The unoccupied ports of the extreme guns of the 6-inch battery are filled by rapid-firing guns. There will be a torpedo-launching tube in the stern and two on each broadside. The armor on the belt is 18 inches thick and steel faced. It is 150 feet long and 7.5 feet deep, of which 5 feet is below water; the armored bulkheads at its ends are 16 inches thick. There is a 3-inch armored deck in three thicknesses of 2-inch and ½-inch plates about 3 feet below the water-line, curving down at its ends and sides to meet the armor belt. A protective deck reaches from the lower edges of the armored bulkheads to the extremities. The 6-inch battery is protected from raking fire by 6-inch steel-faced armor screens reaching from the sides to the barbettes. The sides of the ship at the battery deck are of 1-inch steel. The barbette turrets are of 14 to 16 inch inclined steel-faced plates with armored loading-tubes. The conning tower is abaft the forward tower with 9 to 12 inch compound armor and an armored tube for communication and steering-gear. All along the length of the engines and boilers there is 9 feet of coal protection, with wing-passages outside the coal for communication, &c.

There are two separate engine-rooms and four separate boiler-rooms. The engines will develop 7,500 H. P. with natural draught and 9,800 with forced draught. The contract speed is 16 knots, but 17 will probably be reached. The coal supply is ordinarily 900 tons, but there is room for 1,200. The ship will carry a second-class torpedo boat, a 48-foot picket boat, a 37-foot steam-launch, besides the usual complement of boats; and her crew will number 450.

### ORLANDO—UNDAUNTED—NARCISSUS—AUSTRALIA—GALATEA.

These five ships are of the belted-cruiser class, and the contracts for building them were closed about the end of April, 1885. They are to be finished in two and one-fourth years.

The Australia and Galatea were awarded to Napier & Sons, of Glasgow, for £215,000 each. Two of the others were given to Palmer & Co., Jarrow, and the fifth to Earl & Co., Hull.

These ships are all built of steel, and are to be developments of the Mersey class, as that class was of the Iris. The following are the dimensions of the new class: Length, 300 feet; breadth, 56 feet; draught, 21 feet amidship; displacement, 5,000 tons.

The armament will be two 18-ton 9.2-inch guns mounted on the upper deck as bow and stern chasers, with arcs of fire of about 270°; also ten 4-ton 6-inch guns on the upper deck between the heavy guns. The four extreme guns of the 6-inch battery are mounted on half-turrets on the sides and command arcs of 159°, of which 4° is on the opposite side of the ship. The other six guns are mounted on central-pivot carriages in recessed ports and command 60° forward and as much abaft the beam. The large ports necessitated by this arrangement are filled by circular steel shields revolving with the carriages.

On the main deck amidships are four Nordenfeldts, two on each side, firing through long, low ports with arcs of 120°, and four more are on the same deck in half-towers, one on each bow and quarter. There are also six rapid-firing 6-pounders on the main deck in half-towers, two of which are forward of the first-mentioned Nordenfeldts and four abaft them. The four extreme 6-pounders fire in a fore-and-aft line.

On the protective deck are mounted four torpedo-launching carriages, one on each bow and quarter. They train within 10° of the fore-and-aft line and command 90°. On the platform deck are four fixed under-water launching tubes, below the armor belt. Two, firing broad on the bow, are at the corners of the armor belt and armored bulkhead; the other two are just abaft them and fire on the broadside. There are machine-guns in the tops. It is noticeable that in these ships the secondary battery is on the lower deck. The water-line is protected amidships by a 10-inch steel-faced armor belt 200 feet long. An armored bulkhead crosses the ship at each end of the belt.

An armored deck, of from 2 to 3 inches, at the upper edge of the belt protects the machinery, and the ends are protected by an armored deck extending from the lower edge of the armor belt. The coal is an important part of the armor. The bunkers extend all along the midship part of the ship just above the protective deck, with thwartship bunkers at their ends, and walls of coal about 6 feet thick run the length of the boilers and machinery, between the protective deck and the inner bottom, leaving wide, empty wing-passages outside of them. There is also a conning tower with 13 inches of armor abaft the forward 9-inch gun, with an armored communication-tube and armored loading hoists for the heavy guns.

The engines are to work independent twin screws, and will be the first in the royal navy of the triple expansion type; the steam pressure will be 125 pounds, and will be furnished by four double-ended boilers working with forced draught in separate fire-rooms, divided by a longitudinal bulkhead. The H. P. will be 7,500, giving a speed of 17½ knots. The coal capacity will be 900 tons.

There will be two masts with fore-and-aft sails, pole topmasts, and very large protected tops; also duplicate steering gear, mechanical ventilation, &c.

### THE POLYPHEMUS.

The Polyphemus was built at Chatham; was laid down in 1878, and launched in 1881. On her first trial trips her boilers proved unsatisfactory and were removed. She has now (May, 1885) just completed her final trial trips with most satisfactory results.

She is a twin-screw ram and torpedo vessel, and has no heavy gun armament. Her dimensions follow: Length, 240 feet; beam, 40 feet; draught aft, 21 feet 3 inches; displacement, 2,640 tons. The vessel is almost completely submerged, and depends upon artificial light and forced ventilation throughout her interior at all times. The armor protection is afforded by a 3-inch turtle-back rising above the water-line, but with submerged edges, made of small tiles of Whitworth compressed steel secured to 2-inch plates. She will have eight Nordenfeldt guns, but her principal weapons will be her ram and forty Whitehead torpedoes, launched from above-water carriages or through one bow and four broadside under-water launching tubes, the recent trials showing that this may be done at any speed. The steering gear is worked by steam, and besides the main rudder are two auxiliary ones under the bows which may be raised at will into recesses. The latter may be used at any time in conjunction with the main rudder, but are particularly effective when going astern.

The engines are of the horizontal type, and developed on trial 5,500 H. P., giving a speed of 17.847 knots, nearly a knot in excess of the estimate. The boiler pressure is 110 pounds, and the difficulty of making good the junction of the tubes and tube sheets caused the original boilers to be removed (through the bottom). The new boilers are eight in number, long and low, with two furnaces in each boiler, an intermediate fire-box, and the tubes beyond, and are in four independent water-tight compartments.

Two new Polyphemuses are to be laid down. They will be rather larger with a small gun armament, and an ordinary deck above the turtle-back will give greater habitability. This, with a greater coal supply, will give independent cruising power, which the present vessel was not meant to have.

### THE SCOUT AND FEARLESS.

The Scout is classed as a torpedo cruiser. She will have a ram bow, a long poop and forecastle, a high rail amidships, and a three-eighth-inch steel protective deck over machinery. She also has a coal protection of five to six feet in thickness in wake of machinery. Coffer-dams are placed about all hatches and scuttles. The conning tower is on the forecastle and is protected by two inches of steel armor. The steering-gear is entirely below water.

Her principal dimensions are: Length, 220 feet; beam, 34 feet; greatest draught, 14.5 feet; displacement, 1,430 tons. She is to have two horizontal two-cylinder compound engines, of 26 and 46 inches diameter by 2 feet 6 inches stroke, driving twin-screws. It is estimated that the engines will develop 3,200 horse-power and a speed of more than 16 knots. The boilers, four in number, are cylindrical, 10 feet in diameter by 18 feet in length, and are built of steel.

The Scout is to be armed with torpedoes, and is fitted with eleven launching tubes, ten above and one below water. The below-water tube is in the stem. Of the above-water tubes two are fixed, one to fire directly ahead and one astern, and the others, in broadside, are capable of being trained. She will also carry four 5-inch B. L. R's, two on the forecastle and two on the poop.

The Scout will be a fine sea-boat, and is designed to accompany the battle-ships of the fleet. Her coal capacity is 450 tons, and her probable cost $324,109.

The design of this class of vessel has been so favorably received that seven others of 1,600 tons displacement have been ordered, and are now in construction. Their names are the Archer, Brisk, Cossack, Mohawk, Porpoise, Tartar, and one not named. These vessels will have a protective deck throughout their length, and will carry a heavier battery than the Scout—six 6-inch B. L. R's on sponsons, two on the forecastle, two on the poop, and two in the waist.

## FRANCE.

### THE FORMIDABLE.

The Formidable is a first-class armored barbette-turret twin-screw line-of-battle ship, built of iron and steel. She was laid down in 1879, launched in 1885, at L'Orient, and will probably make her trial trip in 1887. Her probable cost is 16,000,000 francs. The following are her dimensions: Length, 104.4 meters (342 feet 6 inches); beam, 21.34 meters (70 feet); draught, 7.9 meters (26 feet); displacement, 11,336 tons. There is a double bottom under all the midship part of the ship, and eleven water-tight bulkheads, rising as high as the armored deck, or 1.10 meters (3 feet 8 inches), above the water-line. Besides, a number of longitudinal bunkheads complete her subdivision and give her rigidity. The Formidable has a ram bow and several torpedo-launching tubes. Her armament consists of three 75-ton 42-centimeter (16.5-inch) guns in barbette turrets, all on the midship line, of twelve 14-centimeter (5.5 inches) in broadside, and eight Hotchkiss guns, of which two are mounted on the signal masts. The turrets have 40-centimeter (15.7-inch) steel armor on their sides, with steel bullet-proof hoods capping them. The whole water-line is protected by a steel belt varying from 35 centimeters (13.7 inches) at the extremities to 55 centimeters (21.6 inches) amidships, and there is a deck armored with 8-centimeter (3.1-inch) plates over all its length, except over the boilers and machinery, where it is 10 centimeters (4 inches). The total weight of armor is about 3,500 tons. Her engines are both of the compound three-cylinder type, which will develop 8,320 I. H. P., with forced draught, giving a speed of 15.2 knots. The coal supply is 800 tons, good for 1,650 miles at full speed, or 3,000 at 10 knots. Although she has two military masts she will be without sail power. Her crew will be 500 men.

Caïman.—Laid down at Toulon in 1877. Launched in 1885.
Indomptable.—Laid down at L'Orient in 1877. Launched in 1883.
Requin.—Laid down at Bordeaux in 1878. Contract built. Launched in 1885.
Terrible.—Laid down at Brest in 1877. Launched in 1881.

These ships are armored twin-screw barbette-turret ships, built of iron and steel, and are meant for coast-guard use as well as for battle ships.

The following are the Caïman's dimensions: Length at water-line, 84.8 meters (278 feet); breadth, 18 meters (59 feet); draught, 7.50 meters (24 feet 8 inches); displacement, 7,230 tons.

She has a heavy ram bow and a torpedo outfit, and will be armed with two 75-ton 16.5-inch guns, each in its own turret, one forward and one aft. Each gun has an arc of fire of 270°. There are besides four 10-centimeter (3.9-inch) guns in barbette at the corners of the spar deck, which reaches between the heavy guns, and Hotchkiss guns. She has 45-centimeter (18.6-inch) armor on the turrets, and 35 centimeters to 50 centimeters (14.8 to 20.6 inches) on the water-line belt, and 8 centimeters (3.1 inches) on the armored deck. There are also steel hoods over the breech of the heavy guns. The engines, from Creuzot, are of the three-cylinder compound type, and are to develop 4,800 H. P., with natural draught, giving a speed of 14 knots. The boilers are twelve in number, with two furnaces each, and are placed with their backs to the midship line. There are four smoke-pipes, two on each side. Just forward of the smoke-pipes is the conning tower, and forward of that is the tripod foremast, and then comes the forward gun. Abaft the smoke-pipes at some distance is another tower, then the tripod mainmast and the after gun. The masts are only for signaling and mounting Hotchkiss guns. The crew will number 500. Cost, about 10,500,000 francs.

### THE MILAN.

This vessel was designed in 1879 for a torpedo dispatch vessel, but is now intended solely as a scouting vessel. The trials of her engines were completed in May, 1885. She was built at St. Nazaire by contract, and has the following dimensions: Length, 92.4 meters (303 feet); breadth, 10 meters (32 feet 10 inches); draught, 3 meters forward, 4.60 meters aft (9 feet 10 inches and 15 feet 1 inch); displacement, 1,550 tons. She is built of steel and is very light, and has a swan-breasted ram bow. She is unprovided with torpedoes. Her armament consists of five 10-centimeter (3.9-inch) B. L. R's on hydraulic carriages, one on the bow, one on the stern, and the others on the broadside on shifting pivot carriages, to fire on either side, and eight 37-centimeter (1½-inch) Hotchkiss guns. She has twin screws, each worked by two compound tandem engines, and Belleville boilers. On her trial, at a little more than load-draught, she made 18.4 knots in a rather rough sea, developing 4.132 H. P. with natural draught; more than had been expected with forced draught. This trial proves the Milan the fastest man-of-war in existence. Her rig is that of a three-masted schooner, and her coal supply is 300 tons.

### BELLEVILLE BOILERS.

The Belleville boiler is of the same general type as the Herreshoff boiler, well known in this country.

As the result of extensive trials on board the French man-of-war Voltigeur, of 811 tons and 1,000 H. P., this type is regarded with great favor in the French navy, and has been fitted in the new fast cruiser Milan, of 1,640 tons and 3,800 H. P.

The Voltigeur has six boilers—three on each side—placed back to back, separated by sheet-iron plates, and the group is roofed over with sheet-iron, serving to collect the gases of combustion and direct them to the smoke-pipe.

The furnaces are rectangular, about 4½ feet square, with two doors on account of their width, and the grate-bars are very deep and undulating, so that they touch each other, forming lozenge-shaped air-spaces. This keeps the grate-bars cool, prevents clinker, and gives them a longer life. [In the latest boilers the grate-bars are tubular, and the feed-water passes through them on its way to the boiler, thus accomplishing the same result.] The walls of the furnaces are of fire-brick, which causes a very high temperature in the combustion chamber. Over each furnace are five "elements," or nests of tubes, forming the boiler. Each nest consists of two tubes horizontally and nine tubes vertically, joined together in pairs at their ends, so that water enters the first tube at the bottom, passing successively through all the tubes till it issues from the last as steam. The heated gases pass directly upward between these water-tubes, and their direct impact produces the maximum heating effect.

Each element is connected by its first lower tube with an automatic feed-regulator, separate for each boiler. On account of the small contents of the tubes it is necessary that the supply of feed-water should be constant and regular. The last tube is connected with a steam-drum or "purifier" at the top of the boiler, which serves the double purpose of drying the steam, which comes up very wet, and of freeing from impurities the feed-water which flows through it. The purifier is cylindrical and contains a plate which gives a rotary motion to the entering steam, freeing it from the water in it by centrifugal force. The water from the feed-pump enter ing the purifier comes in contact with the steam, and the resulting quick rise of temperature precipitates the calcareous matter, which, however, is carried in suspension to the mud-drum, where it is blown out, while the water goes on to the feed-regulator.

Before the steam gets to the boiler it passes through a general purifier, similar to the separate ones attached to each boiler.

The following are the advantages claimed for the Belleville boiler:

(1) Slight danger in case of rupture, owing to small amount of water contained in the boilers.

(2) Use of high pressures without danger.

(3) Steam pressure is quickly raised.

(4) Economy of fuel.

(5) Light weight.

(6) The boilers are low, and may be kept below the water-line.

(7) Pressure in boilers may be varied quickly without danger of foaming.

(8) No water is carried over to the cylinders.

(9) Facility for repairs, as any element may be dismounted in a short time while the others remain for service.

(10) Easily kept in order, as all parts are readily accessible.

(11) Easily put on board, as it is made of small pieces which may be assembled on board.

(12) On account of the high temperature of the combustion chamber hard coals may be used without the disadvantages usually attending them.

The Board which examined the boilers in 1880 found that their economy of fuel was not great, that they were complicated, and that firing was harder work, but the new tubular furnaces are said to be easy to work. The Board's *first objection was contradicted by the results of an extended cruise.*

### BELLEVILLE SPEED REGULATOR.

The main engine-shaft works two little pumps which force water through a regulator against the pressure of a spring. The outflow of the water is by a graduated valve. The spring of the regulator controls the throttle-valve of the engine. It is evident that if the speed of the engines or position of the valve is altered the throttle-valve will move, owing to the change of pressure on the spring. The delivery of the pumps, the size of the valve, and strength of the spring are so proportioned that at the normal speed of the engines sufficient steam is admitted to maintain that speed. The apparatus is thus a quick-acting speed regulator or governor if left to itself, while by working the cock controlling the outflow the speed may be altered. By connecting this valve with the captain's conning tower he is given instant and direct control of the speed of the ship.

ACHÉRON.—Launched at Cherbourg May, 1885.
COCYTE—PHLÉGÉTHON—STYX.—Building at Cherbourg.

The Achéron is a twin-screw armored steel gunboat of the following dimensions: Length, 55.2 meters (181 feet); breadth, 12.30 meters (40 feet 4 inches); draught, 3.6

meters (11 feet 10 inches); displacement, 1,640 tons. She carries a 27-centimeter (10½-inch) gun in a barbette turret forward, and two 10-centimeter (3.9-inch) guns amidships, one on each side. The bridge reaches over them, and the sides tumble home, to give each a full semicircle of firing arc. At the forward edge of the bridge is the circular conning tower, out of which rises a military mast. The whole water-line is belted with 9½ inch armor. There will be four boilers, each with one furnace, and the speed will be 13 knots.

### CONDOR—ÉPERVIER—FAUCON—VAUTOUR.

These ships are of the class officially known as cruising torpedo-ships (croiseurs-torpilleurs). They are identical in design. The first two are building at Rochefort and the others at Toulon.

The Condor is the most advanced, and was launched in May, 1885. She is built of steel, and the following are her principal dimensions: Length, 69.75 meters (229 feet); breadth, 8.9 meters (29 feet); draught, 4.24 meters (14 feet); displacement, 1,260 tons. She has a swan-breasted ram bow and five above-water torpedo-launching tubes installed between decks, two on each broadside and one as a sternchaser. She has, besides, five 10-centimeter (3.94-inch) guns, one of which is a stern-chaser under the poop, two are bow-chasers under the forecastle, firing from ahead to the beam, and two more are in barbette half-turrets abreast the smoke-stack and are protected from plunging fire by the bridge which extends over them. In order that these two guns may command the entire horizon, the sides tumble home very much to allow them fore-and-aft train. There is an armored deck reaching fore and aft, protecting the machinery, magazine, and steering gear, and the ship is divided into water-tight compartments above the armored deck. She has twin screws, with engines aggregating 2,000 I. H. P., and giving an estimated speed of 17 knots, and is three-masted with leg-of-mutton sails. The officers' quarters are under the poop.

### BOMBE—COULEUVRINE—DAGUE—DRAGONNE—FLÈCHE—LANCE—SALVE—SAINTE-BARBE.

These vessels form a squadron of torpedo-dispatch boats (avisos-torpilleurs). The construction of the first six was given to a private firm, Forges et Chantiers du Havre, and the Bombe, the first of the squadron, was launched on April 16, 1885. She is built of steel and of the lightest possible scantling. Her principal dimensions are as follows: Length, 187 feet 10 inches; breadth, 20 feet; draught, 5 feet 6 inches; displacement 321 tons. She has a ram bow and two torpedo-launching tubes, and is armed with two 9-centimeter (3.54-inch) guns and three machine-guns. The engines work twin screws, and the I. H. P. is to be 1,800, giving an estimated speed of 17 knots. In June, 1885, the Bombe made 18 knots. The coal bunkers extend over the boilers. She is three-masted with leg-of-mutton sails.

The following is the classification of torpedo vessels and boats recently adopted in the French navy:

I. Torpedo-cruisers (croiseurs-torpilleurs): Displacement of from 1,260 to 1,280 tons.

II. Torpedo-dispatch boats (avisos-torpilleurs): Displacement from 320 to 360 tons.

III. Sea-going torpedo boats (torpilleurs de haute mer): Displacement of 50 tons and over.

IV. Coast-guard torpedo boats (torpilleurs-garde-côtes): *a*, displacement 25 tons; *b*, displacement 50 tons.

V. Picket torpedo boats (torpilleurs-vedettes): Displacement less than 25 tons.

# ITALY.

## THE RUGGIERO DI LAURIA, FRANCESCO MOROSINI, ANDREA DORIA, RÉ UMBERTO, AND SICILIA.

Besides the Italia and Lepanto, launched in 1880 and 1882, and now being completed, the Italians continue to make other formidable additions to their fleet.

The Ruggiero di Lauria, Francesco Morosini, and Andrea Doria, are in different stages of advancement; while the Ré Umberto and Sicilia have recently been laid down.

The Lauria was launched in August, 1884, and the Morosini in June, 1885. These vessels are of the same size as the Duilio, with all the improvements of construction, armament, and armor made since 1875. Their displacement is 10,000 tons and their horse-power 10,000.

The Doria, not yet launched, and the Ré Umberto and Sicilia are to be sister ships to the Italia. It is intended, however, to give the latter pair of ships 15,000 horse-power.

All these ships are to carry four 100-ton B. L. R's, in addition to a number of 6-inch B. L. R's, rapid-fire and machine guns. They will be protected with 17.7–18.5 inches of steel armor.

## THE GIOVANNI BAUSAN.

This vessel was laid down by Sir Wm. Armstrong and Co. at Elswick in 1882, and was delivered in May, 1885.

She is a steel cruiser, schooner-rigged, similar to the Esmeralda but rather larger, having the following dimensions: Length, 280 feet; breadth, 42 feet; draught, 18½ feet; displacement, about 3,100 tons. She has a ram bow and three under-water launching tubes for Whitehead torpedoes. Her armament consists of two 10-inch B. L. R's, mounted as bow and stern chasers, loaded and worked by hydraulic gear, with arcs of fire of 240° each; six 6-inch 4-ton guns on Albini central-pivot carriages mounted in broadside; two 6-pounder rapid-firing guns of the Elswick type, and Hotchkiss and Nordenfeldt machine-guns. The guns are protected by heavy steel shields attached to the carriages, and the light guns aloft are mounted in small revolving turrets. There is an under-water protective steel deck 1½ inches thick and cork-filled cellular compartments along the water-line. The steering gear is hydraulic. There are twin screws, and the engines developed upon trial 6,000 I. H. P., making 116.5 revolutions with a speed of 17.5 knots. The engines and boilers are of the Esmeralda type. The coal supply is 600 tons, good for 5,000 miles at 10 knots.

## THE ETNA, STROMBOLI, AND VESUVIO.

These vessels are classed as torpedo-rams and are now in process of construction; the first at Castellamare, the second at Venice, and the third at Leghorn. The Stromboli will be launched during the summer.

These are the largest torpedo-rams yet laid down by any nation. They are similar in design to the Giovanni Bausan. Their principal dimensions are: Length, 284 feet; beam, 43.3 feet; draught, 19.4 feet; and displacement 3,474 tons.

## THE ARMOR FOR THE LEPANTO.

It is known that after the armor trials at Spezia, in October and November, 1884, M. Schneider, of Creuzot, was awarded the contract for providing the armor plates for the Lepanto. The contract requires the delivery of the plates, of 48 centimeters thickness, at the price of 1,955 francs the ton. The total weight of armor required is about 1,700 tons. The order will be delivered in two lots, and one plate of each lot will be subject to a firing test.

This test will be under conditions much more severe than those governing that of the English compound plates intended for the Italia, which consisted in a single shot fired from a 45-centimeter gun, aimed at the center of the plate, with a force exceeding by one-quarter that necessary to have pierced a wrought-iron plate of the same thickness. In the middle of the anterior face of the plate, 2.50 meters wide x 3.20 meters long, will be traced an equilateral triangle, whose sides are 1.25 meters long, the apexes being distant from the nearest edge at least 70 centimeters.

A 45-centimeter cast-iron projectile will be fired at each apex. The energy of the first shot will be that which is theoretically necessary to pierce an iron plate of the same thickness. The projectiles in the last two fires are to have energy sufficient to pierce an irqn plate of one-fourth greater thickness.

In order that the lot may be accepted it is required that none of the projectiles shall entirely pass through the plate, and that after the first two shots no piece of the plate shall be detached so as to uncover the backing; it is permitted that some pieces may be knocked off by the third shot.

If the plate thus tested does not satisfy the conditions, the contractor will have the right to present another of the same lot, to be subjected to the same proof; and the result will determine the definite acceptance or rejection of the lot.

It is believed in Italy that the Creusot Works will succeed in mastering these difficult conditions.

## GERMANY.

### THE OLDENBURG.

This ship was launched in December, 1884, by the Vulcan Company at Bredow, near Stettin. She was originally designed to be of the Sachsen type, but was essentially modified during construction, and is now much smaller than the Sachsen. She is intended for service in the Baltic principally. Her dimensions are as follows: Length, 75 meters (246 feet); breadth, 18 meters (59 feet); draught, 11 meters (36 feet); displacement, 5,200 tons. She is armed with six long 24-centimeter (9.4-inch) guns in the central battery, and two more of the same size forward. There are also four 15-centimeter (5.9-inch) guns on the poop, besides three 7-centimeter ($2\frac{3}{4}$-inch) Hotchkiss guns and two 8-centimeter (3.1-inch) boat guns. There are torpedo-tubes, and a ram bow. The central redoubt is protected by plates of 33 centimeters (12.9 inches), from Dillengen. She has twin screws and compound engines, aggregating 3,900 I. H. P. each, with four cylinders. The speed will be 14 knots.

### THE ALEXANDRINE AND ARCONA.

The Alexandrine was laid down at Kiel in July, 1881, and was launched in February, 1885. She belongs to the class of unarmored cruiser-corvettes, is barque-rigged, and has a two-bladed hoisting-screw. Her dimensions are as follows: Length, 68 meters (223 feet); breadth, 12.5 meters (41 feet); draught, 5 meters (16 feet 5 inches); displacement, 2,370 tons. She is of iron, sheathed with a double layer of teak, and coppered; and is armed with ten $10\frac{1}{2}$-centimeter (4.1-inch) guns, four machine-guns, and one torpedo-tube. The speed will be from 14 to 15 knots, with a horse-power of 2,400. There are two fire-rooms, with four cylindrical boilers in each.

The Arcona was launched in May, at Dantzig, and is a sister ship to the Alexandrine.

## RUSSIA.

### THE TCHESME, SINOPE, AND CATHERINE II.

The first two are being built at Sebastopol by the Black Sea Steam Navigation Company, and the third at the Nicolaïef dock-yard. They are sufficiently advanced to be launched during the present summer. They are barbette battle-ships protected on the water-line by 10 to 15 inches of compound armor. Their dimensions are: Length, 314 feet; beam, 69 feet; draught, 25 feet; and displacement, 10,181 tons. They are to be fitted with three-cylinder compound engines driving twin screws, developing 9,000 horse-power and 16 knots speed.

The battery will consist of six 12-inch B. L. R's mounted in three pear-shaped towers covered with 12 inches of armor, one 6-inch pivot gun astern, and six 6-inch rifles in broadside. (It is probable that some of the barbette guns will be mounted on disappearing carriages.)

The cost of each of these ships is about $3,131,000.

### THE ADMIRAL NAKHIMOFF, MOSKWA, ADMIRAL ARKASS, AND ALEXANDER II.

These are armored barbette cruisers of similar design, but different dimensions and armament.

The Nakhimoff is protected on the water-line by a compound armor belt of 8 to 10 inches thickness. Her principal dimensions are: Length, 333 feet; beam, 61 feet; draught, 25.9 feet; and displacement, 7,781 tons. It is expected that the compound engines will develop 8,000 horse-power and drive the vessel at 16-knot speed.

The battery consists of four 9-inch B. L. R's mounted in four barbette towers protected by 12 inches of armor, and ten 6-inch B. L. R's in broadside.

The Nakhimoff will be launched at St. Petersburg this autumn. Her estimated cost is $1,910,000.

The keel of the Alexander II was laid down this spring at St. Petersburg. This vessel will be somewhat larger than the Nakhimoff, will be protected by armor 14 inches thick, and will carry two 12-inch, four 9-inch, and eight 6-inch B. L. R's.

The Moskwa and Admiral Arkass are smaller than the Nakhimoff, being of 5,754 tons displacement. Their barbette armor is 12 inches thick, but the belt is reduced in thickness to 5.8 to 8.3 inches.

The Russian Government also intends to begin the construction at St. Petersburg of an armored vessel of 8,632 tons displacement. The battery will consist of two 9-inch and four 8-inch B. L. R's in barbette towers, and eight 6-inch B. L. R's in broadside.

## BRAZIL.

### THE AQUIDABAN.

The Aquidaban was built by Samuda Bros. She was laid down in June, 1883, and her trials were finished in May, 1885. She is a ship-rigged, twin-screw, armored turret ship of the following dimensions: Length, 280 feet; breadth, 52 feet; draught, 18 feet; displacement, 5,000 tons; is built of Siemens steel, has many water-tight compartments, and is sheathed with wood and copper as high as two feet above the water-line. She has a ram and five Whitehead torpedo ports. The armament consists of four 9-inch 20-ton Armstrong guns, mounted with hydraulic gear, in two echelonned turrets; four 5¾-inch Armstrong guns, on Vavasseur carriages, mounted on the upper deck, two firing right ahead and two right astern; and fifteen Nordenfeldt guns.

The turrets have 10-inch steel-faced armor and revolve in an armored breastwork protecting the loading gear. The engines, boilers, and magazines are protected by a 10-

inch to 11-inch water-line armor belt seven feet wide. There is a 2-inch steel deck extending fore and aft, which dips below the water-line at the extremities, strengthening the ram and protecting the tiller and steam steering-gear, and the engines are of the three-cylinder compound type. The boilers are eight in number. On the measured mile trial they developed 5,270 I. H. P. with natural draught, giving 15.257 knots, the contract being for 3,500 H. P. and 14 knots. With six boilers and forced draught the I. H. P. was 6,210 and speed 15.8 knots. With one screw the speed was 11.5 knots with 15° helm-angle.

## CHILI.

### THE ESMERALDA.

In April, 1885, the Esmeralda ran from Valparaiso to Callao, a distance of 1,292 miles, in one hundred and eight hours. The last eight hours of the run the engines were just turning over. Allowing 4 knots speed for these eight hours, the distance run in one hundred hours was 1,260 miles, making the average speed 12.6 knots. The speed by the log for the one hundred hours was 14.56 knots. The revolutions varied from 75 to 90 a minute, averaging 82.3. The average consumption of coal per hour was 4,560 pounds per hour. The boiler pressure varied from 65 to 84 pounds, but was usually from 75 to 80 pounds. The wind was always very light. The current was favorable.

During the exhaustive trials before her departure from England the highest speed attained by the Esmeralda was 18¼ knots per hour.

The coal consumption is as follows:

| | Tons per day. |
|---|---|
| At 18 knots | 200 |
| At 17 knots | 150 |
| At 16 knots | 100 |
| At 15 knots | 80 |
| At 12 knots | 40–45 |
| At 10 knots | 25 |
| At 8 knots | 18 |

Coal capacity, 600 tons.

Revolutions at full speed, 120; at 12 knots, 70.

## JAPAN.

### THE TAKACHIHO-KAN AND NANIWA-KAN.

These ships, of the general type of the Esmeralda, were built by Sir Wm. Armstrong & Co. for the Japanese Government, and were launched May 16 and March 18, 1885, respectively.

They are twin-screw steel cruisers, of the fastest and most heavily armed type, and are the largest ships yet built by this firm, having the following principal dimensions: Length, 300 feet; breadth, 46 feet; draught, 18½ feet; displacement, 3,600 tons. They have ram bows and can discharge Whitehead torpedoes from four above-water ports, and are armed with two 28-ton 28-centimeter (10¼-inch) guns, mounted on central pivot carriages as bow and stern chasers; six 15-centimeter (5.9-inch) guns in broadside on central-pivot carriages; and ten 1-inch machine-guns and two rapid-firing guns, besides four Gatling's mounted in the tops of two military masts. All the guns except the Gatlings are on the upper deck and carry steel shields attached to their carriages. Each ship has a protective deck, from 2 inches to 3 inches thick, extending fore and aft, with the sides curving below the water-line, and the hulls are minutely subdivided.

The engine-rooms and fire-rooms are double, and the engines are to develop about 7,500 I. H. P., giving a speed of from 18 to 18½ knots.

# ORDNANCE.

## UNITED STATES.

The batteries of the new cruisers are in a forward state, and will be ready before the ships are completed. The 6-inch B. L. R's for the Atlanta are practically finished. One of the 8-inch B. L. R's will be proved shortly at Annapolis.

The building of these guns has been allotted as follows:

| | 5-inch. | 6-inch. | 8-inch. |
|---|---|---|---|
| To the Washington navy-yard | 2 | 10 | 4 |
| To the South Boston Iron Works | | 6 | 2 |
| To the West Point Foundry | | 5 | 2 |
| Total | 2 | 21 | 8 |

To these should be added two 10-inch B. L. R's for the Miantonomoh and one 10½-inch for the Puritan. These are building at the Washington yard, but are in a more backward condition owing to the delays in the delivery of the gun forgings by foreign makers.

Designs are completed and calculations made for 12 to 16 inch B. L. R's.

The practice with the 6-inch (Mark I) may be referred to as offering the confident hope of better results as to velocity and pressure from the American brown powder than those given by the German cocoa powder. With a charge of 50 pounds of powder and 100-pound projectile at least 2,000 f. s. may be the velocity expected. The 6-inch B. L. R. has given a range of over 7,000 yards at 10° elevation.

The following table shows the weights of gun, charge, and projectile for each class:

| Gun. | Weight of gun. | Charge. | Projectile. |
|---|---|---|---|
| | *Pounds.* | *Pounds.* | *Pounds.* |
| 5-inch B. L. R | 6,200 | 30 | 60 |
| 6-inch B. L. R | 11,000 | 50 | 100 |
| 8-inch B. L. R | 27,050 | 125 | 250 |
| 10-inch B. L. R | 55,000 | 250 | 500 |
| 10½-inch B. L. R | 64,500 | 275 | 550 |
| 12-inch B. L. R | 100,000 | 425 | 850 |
| 16-inch B. L. R | (*) | 1,000 | 2,000 |

* One hundred and ten tons.

The secondary battery of Hotchkiss guns for the new cruisers is to be as follows:

| Chicago. | Boston and Atlanta. | Dolphin. |
|---|---|---|
| Two 57mm rapid fire.<br>Two 37mm rapid fire.<br>Four 47mm revolving cannon.<br>Two 37mm revolving cannon.<br>Two Gatlings. | Two 57mm rapid fire.<br>Two 47mm rapid fire.<br>Two 37mm rapid fire.<br>Two 47mm revolving cannon.<br>Two 37mm revolving cannon.<br>Two Gatlings. | Two 57mm rapid fire.<br>Two 47mm revolving cannon.<br>Two Gatlings. |

The Ordnance Department, Washington navy-yard, has annealed and is boring a 10-inch tube for a Woodbridge wire-wound gun for the Army.

### THE HOTCHKISS RAPID-FIRING GUN.

The limit of weight imposed on machine-guns admits of very small calibers only unless the number of barrels is reduced, and to meet the need for a rapid-firing gun of fairly large caliber Mr. Hotchkiss designed his single-barrel gun, which fires from fifteen to twenty rounds a minute.

The following is a description of the principal features of the gun: It is fixed on a pivot, making it a non-recoil gun, is aimed by a man supporting himself on the shoulder rest attached to it, and has a pistol grip, with a trigger for firing.

The breech is closed by a wedge moving vertically in a slot through the gun, the front face of the wedge being perpendicular to the bore. The wedge has cut in its right face a peculiarly curved slot which engages the end of the crank, giving motion to the wedge. Inside the wedge is the hammer and firing arrangement, which is worked by a cocking cam on the crank axle.

Owing to the shape of the slot in which the crank works, when the breech is opened the wedge is motionless until the hammer is cocked, when the wedge descends. As the wedge clears the bore a slot in its left side throws the extractor, carrying the shell directly to the rear. The new cartridge is inserted and the reverse motion of the crank raises the wedge and brings the firing-gear against the trigger. Safety from accident is afforded by the fact that the firing-hammer cannot protrude through the face of the wedge until the wedge is home, and the trigger is quite disconnected from the rest of the firing-gear, acting only by contact.

*Hotchkiss rapid-firing guns.*

| Caliber. | | Length of gun. | Weight. | Weight of projectile. | Initial velocity. | Perforation point blank (steel). | Rapidity of fire per minute. | Crew. | Remarks. |
|---|---|---|---|---|---|---|---|---|---|
| *Inch.* | *Mm.* | *Inches.* | *Pounds.* | *Pounds.* | *F. s.* | *Inches.* | *Rounds.* | *No.* | |
| 1.45 | 37 | 67.7 | 308 | 1.87 | 2,034 | 2.75 | 20 | 2 | More powerful than ordinary 37-millimeter guns. |
| 1.85 | 47* | 77.0 | 397 | 3.30 | 1,706 | 3.00 | 20 | 2 | To fill up port openings in forts for heavy guns when the great guns are not in use; removed in one minute. |
| 1.85 | 47† | 80.6 | 506 | 3.30 | 2,034 | 3.93 | 18 | 2 | Light deck armament and boat gun. |
| 2.24 | 57 | 99.0 | 815 | 6.00 | 1,837 | 5.10 | 16–18 | 3 | For deck, boat, and field use. |

* Light. † Long.

## ENGLAND.

### NOTES UPON IMPROVEMENTS IN ORDNANCE.

No radical changes have taken place during the last year in guns building for foreign governments, though some advance has been made in details by which those now being put in service have been improved. England still holds the lead in the manufacture of heavy guns, and those now building for her navy will combine whatever is found good either in manufacture or principle.

The cup gas-check has given way to the De Bange obturator, and the screw breech-block has been placed in the jacket, instead of the tube. Great length of bore, large chambers, and slow or progressive powders are still the main features of foreign gunnery, though as a marked divergence from these may be cited the Hope system, which is at variance with almost all of the principles heretofore taught or practiced in gunnery. This system, which takes its name from Lieutenant-Colonel Hope, commanding First London Artillery Volunteers, consists in the instantaneous combustion of the entire charge and the motion of the projectile before the charge is ignited.

To accomplish this the cartridge is of peculiar construction. The metal case, such as is used for small-arms, he makes use of as the most perfect system of obturation. Through the center of the charge runs a hollow cylinder, the rear end of which contains 100 grains of fine quick-burning powder, while the forward end rests against the projectile. This he calls his small cannon, and is intended to start the projectile in motion before the combustion of the main charge. Along the entire length of this central cylinder are numerous holes of different sizes, those at the forward end being largest, and all being covered by paper or cloths. This cloth covering is thickest at the rear and decreases in thickness towards the front, where it is quite thin; the object sought being to ignite the charge simultaneously at many points and thus to cause what the inventor terms an explosion or instantaneous combustion of the entire charge. The charge is also of the most rapid-burning powder, and equal in weight to the projectile, which is also modified in shape, being pointed at the base as well as the point. By these means the inventor hopes to maintain the muzzle velocity for a longer time, as the form of projectile claimed is to be that offering least resistance in air.

To stand the heavy strain of explosion, Colonel Hope has patented a process of fluid compression by which he hopes to obtain a dense and homogeneous steel, but as this requires a new and expensive plant no guns as yet have been built upon this system. A hooped gun, however, representing his firing principle was built at Terre Noire, France, which at trial gave excellent results. It will be more accurately described in the French ordnance. The breech-block and chamber are also on a different system from that used in any large gun. The breech-block is in the form of a curved wedge hung by a double T-piece, on the roof of the bore to the rear, about which it pivots. The chamber is a perfect truncated cone, by which loading and withdrawing the metallic case is made easy, and the shoulder at the junction of the chamber and bore is done away with, as it is a very gentle slope from the breech to the cylindrical part of the bore.

*The Armstrong* 10.2-*inch Riband Gun.*—In April, 1884, experiments were carried on at Shoeburyness with Armstrong's new 10.2-inch B. L. R. on the riband system. The weight of this gun is 21½ tons and its length 31 calibers. Over 70 rounds with high charges were fired without accident, though some fault was found in the cup gas-check and some scores were found in the bore from defective bands.

In these trials Palliser shells with Vavasseur rotating rings were used, the rings being placed in front of the old band. The following table gives some of the principal results obtained:

| Charge. | Weight of projectile. | Initial velocity. | Pressure per square inch. |
|---|---|---|---|
| | *Pounds.* | *F. s.* | *Tons.* |
| 245 pounds prismatic powder | 450 | 2,040 | 21.9 |
| 240 pounds prismatic powder | 450 | 1,978 | 21.6 |
| 235 pounds prismatic powder | 450 | 1,950 | 20.2 |
| 235 pounds prismatic powder | 500 | 1,848 | 20.2 |

With a charge of 260 pounds and projectile of 502 pounds this gun gives a penetration at the muzzle of 20.4 inches in wrought iron.

It will be noticed that the pressure in the bore was the same with 235 pounds of powder both with the 450 and 500 pound shot, which conforms to the principle as laid down by Colonel Hope, which is that the strain on the gun comes before the shot moves.

*The Schultz system.*—At Elswick two guns on this system were tried last March. These guns were of 6 and 9 inch caliber. Velocities as high as 2,296 f. s. were reached, but with very high pressures. This system has two distinct features: First, wire winding, and second, the independence of the breech coil, which relieves the tube from longitudinal strain.

*Heavy guns building and ordered.*—The English Government has ordered three 110-ton guns—one to be finished in October, 1885, one in January, 1886, and one in April, 1886. These guns will cost £19,500 each. They are intended for a charge of 900 pounds of cocoa powder and a projectile of 1,800 pounds.

From experiments with the heavy guns built for the Italian Government a velocity of 2,020 f. s. is looked for with a pressure of 17 tons per square inch.

In May the Government commenced the construction at Elswick of a 112-ton B. L. R. gun having a length of 522 inches, or nearly 33 calibers. This gun will have a caliber of 15.9 inches, and the carriage will weigh 91 tons.

*New 5-inch gun.*—The new 5-inch gun now manufactured at Woolwich, and miscalled the Vavasseur 5-inch gun, is a good representation of the new class of English breech-loading high-powered guns, embracing all the advantages of the various systems in vogue and combining in one weapon all that is thought to constitute perfection in gunnery. Its weight is but 38 cwt., though those to follow will weigh 40 cwt.

The general dimensions of this gun are: Length, 11 feet 7½ inches; extreme diameter of breech, 17½ inches; length of the cylindrical part of the bore, 25 calibers; diameter of powder chamber, 5¾ inches.

Weight of charge, 16 pounds; weight of projectile, 50; penetration in iron, 8.7 inches; initial velocity, 1,800 f. s.

It is built entirely of tough steel, and consists of an A tube and jacket, without any of the other tubes or coils common to other guns. The tube and jacket are secured together by a key-ring covered by a hoop. The De Bange obturator and percussion primer are used.

*New 6-inch gun.*—The new pattern 6-inch gun B. L. R., to be known as Mark IV, soon to be constructed in England, will have some improvements in the breech-closing mechanism and a modification of the rear end of the tube, which will be built heavier, to sustain a long-continued fire.

*Gave way under fire.*—During the last year two guns of new construction have given way in England—one a 6-inch and the other a 9.2-inch; the first on board the Active, and the second while under trial at Woolwich. The first was built at Elswick, and had undergone proof-firing. It was then put on board the Active for the trial of a Vavasseur carriage. The service charge is 34 pounds of powder and a 100-pound projectile, while at the time it gave way it was loaded with but 17 pounds of powder and an 80-pound projectile. Four and a half feet of the muzzle was blown off and fell in three parts. The break was five feet from the muzzle, on the left side of the gun, and extended at an angle of about 45° to a point on the right side about four feet from the muzzle. The fracture showed no imperfection in the steel. A committee that examined into the cause of the accident came to the conclusion that a tool or some other obstruction had been left in the gun, and that if the usual scaling charge had been fired the accident would not have occurred.

The 9.2-inch which gave way under experimental fire was a modern B. L. R. on the hoop system. It had been loaded at the time of the accident with 200 pounds of experimental powder (black cylindrical powder). The entire chase from 3 feet 2 inches forward of the edge of the trunnions burst into a multitude of fragments, some of which were carried nearly a mile. This accident seems to have caused distrust in this pattern, and the impression prevails that the chase is not heavy enough to stand the fire of a slow progressive powder, with which the strain is carried much farther forward than with the older kinds. No other solution has been offered for the accident, and it is thought that in future the chase rings will be carried nearer the muzzle. The remainder of the gun was uninjured.

*New patents.*—Among the important patents taken out last year in England for improvements in gun-construction and gun-carriages are the following:

By Albert Sauvée, for loading turret guns in any position: The improvement consists in a hollow central pivot of considerable size: that is, large enough to allow the projectile and the two half-charges to come up in a car at one time. This car is moved up and down the hollow pivot of the turret by hydraulic power, and by guides on the inside of the pivot and a lever on the car it is directed to the loading position in rear of the gun. This patent includes one also for checking the recoil of turret guns.

By Eardley Maitland, Colonel Royal Artillery, for locking hoops: This consists in making each hoop or ring with lugs and spaces of equal size and a space behind each lug equal in size to the lug itself. The hoops are fastened by placing one over the other, so that the lugs shall come in front of the spaces when it is forced on to the depth of the lug and turned, so that each lug comes behind its fellow. The vacant spaces are then filled with steel blocks which prevent any motion of the ring.

By Lieut. Col. William Hope, V. C., for an improvement in gun construction: It consists in an annular mold of great strength, into which steel is poured, and while still liquid subjecting it to great pressure by an annular piston moved by hydraulic power. When the metal has cooled below the welding point the core of the mold is withdrawn and mandrels of different sizes forced through the center of the casting, compressing the metal still more. This is continued, using a mandrel of larger size each time, until the metal has cooled and set.

### THE LARGEST GUN YET DESIGNED.

A monster breech-loader, to be constructed at Woolwich on the wire-wound system, has just been designed for coast defense. It far surpasses any gun yet proposed. Its general dimensions are as follows:

Weight, 156 tons; weight of largest forging, 30 tons; weight of powder charge, 1,700 pounds; weight of projectile, 2,000 pounds; total length, 61 feet 11 inches; length of bore, 700 inches, or 41 calibers and over; estimated muzzle velocity, 2,500 f. s.

## FRANCE.

For coast-defense guns, the French are now constructing cast-iron bodies, hooped and tubed with steel, of the model of 1870 and 1871, but with longer and larger chambers. The calibers of those now building of this pattern are the 27 and 32 centimeter. The guns are also longer than the model of 1870, having a bore of 25 calibers, which will increase the velocity, so it is hoped, by some 35 or 40 meters. As yet none have been subjected to proof.

The guns building for the navy are all of steel. Those of the model of 1875 to 1879 are hooped and tubed, and intended for the armored ships. These guns are of 34 and 37 centimeters. They have a length of bore of 21 calibers. The 37-centimeter will weigh from 72 to 75 tons and will throw a projectile of 560 kilograms (1,232 pounds) at a velocity of 620 meters per second (2,034 f. s.).

The largest range of calibers, however, are being built on the model of 1881. These are of steel, hooped, but not tubed, and are of the following calibers: 6½, 9, 10, 14, 16 (light), 16 (heavy), 24, 27, 34 (short), and 34 centimeters (long).

The 34-centimeter gun will weigh 54 tons. These guns, beginning with the 14-centimeter, have great length of bore, viz, from 28 to 30 calibers, except the 34-centimeter (short), which has a length of 21 calibers. No change is to be made in the projectiles at present in use, except for the 14-centimeter gun, which will use a shell of 30 kilograms, instead of 28 kilograms.

Experiments being carried on at Gavre will, it is expected, end in the adoption of the army shrapnel for the lighter guns, viz, of 6½, 9, and 10 centimeters. This shell has but a small angle of divergence.

The proof of the 6½, 9, 10, 14, and 16 centimeter (heavy) has already been made. In the last two calibers velocities of 600 meters (1,968 f. s.) have been reached with a pressure of 34,300 pounds per square inch, using a shell almost double the weight of powder charge. Equal success is expected in the guns of larger calibers yet to be proved.

*New patents, &c.*—Colonel De Bange has this year patented an improvement on his gas-check, which has been so universally adopted. It consists in using a double, instead of a single ring of asbestos, and also an improved primer, preventing entirely the escape of gas.

In the new patent the plug has a central hole through its entire length, into which is inserted a bouche, which is screwed into the back end of the hole and reaches a little farther than the front end of the plug. This bouche has a block and pin in the face of the plug, preventing it from turning and at the same time holding the movable head of the plug in place. The under side of the movable head has a projecting annular flange separating the inner and outer rings of asbestos. The outer one serves as a gas-check for the plug itself, while the inner ring serves as a gas-check for the bouche. The primer has also the same general principle as the breech-plug, viz, that of a movable head and an elastic ring back of it. Upon this movable head is an ordinary straight friction tube, the wire of which ends in a conical head. On the side of the primer are two lugs which fit in two slots in the rear end of the bouche, so that a partial turn secures the primer in place in the same manner as the breech-plug is secured. The action of this primer is simple. At the moment of firing the shock of discharge forces back the movable head of the primer, compressing the elastic ring, thus closing the passage of gas between it and the bouche, while the cone upon the end of the friction wire is hauled tightly into hole at the rear end of the friction tube, thus closing all passage of gas around the friction wire. The primer can only be introduced when the breech-plug is entirely closed.

It is claimed that this new improvement renders the loading more rapid and prevents all escape of gas, so that cleaning the breech apparatus during action is not required.

The Hope high-powered gun of 127 millimeters (5 inches) built at Terre Noire was last year tested with good results. It is constructed entirely of steel, and consists of a central or A tube with two series of strengthening hoops. The first series consists of three hoops, the rear one being secured to the A tube by a screw thread, while the second is locked to the first by being shrunk over it at the front end, where there is a slot in which fits a corresponding ledge on the second ring. The third is secured to the second in like manner. The second series consists of five hoops, three of which are one meter in length. The fourth is the trunnion ring, and the fifth is a little less than a meter in length. This series is locked to the second, so that the entire gun forms as near as possible one compact mass. The breech is closed by the ordinary screw plug. The powder-chamber is 2½ meters long, or about 16 calibers. The charge is 30 kilograms, or about 66 pounds, which is also the weight of the projectile. The length of the rifled portion of the bore is 24 calibers, and has a right-handed twist with 24 lands. The projectile is 3 calibers long.

Two series of trials were made last year with this gun. The first was at a steel plate 195 millimeters (7.7 inches) thick. The first shot was fired with a charge of 14 kilograms (30.8 pounds), when the pressure in the bore was 3,287 kilograms per square centimeter (46,957 pounds per square inch). The plate was pierced, though the projectile broke in four pieces. The velocity at this discharge was 585 meters (1,919 f. s.). At the second fire a charge of 12 kilograms (26.4 pounds) was used, when the muzzle velocity was 567 meters (1,860 f. s.), and the pressure 2,892 kilograms per square centimeter (41.314 pounds per square inch). At this fire the plate was broken in half, while the projectile, which was of soft steel, remained uninjured.

In the second series the plate used was 257 millimeters (10.1 inches) thick, also of steel.

The first shot of this series was fired with a charge of 21 kilograms (46.2 pounds), when the pressure rose to 3,988 kilograms per square centimeter (56,970 pounds per square inch), giving a velocity of 630 meters (2,067 f. s.). With the second fire the powder charge was reduced to 20 kilograms (44 pounds), when the pressure fell to 3,616 kilograms per square centimeter (51,657 pounds per square inch) and the velocity to 622 meters (2,040 f. s.). There is good reason for believing that these experiments have been carried further and that a velocity of nearly 2,500 feet per second has been reached, but so much secrecy surrounds the experiment made by Colonel Hope that more accurate data cannot be obtained.

Colonel De Bange is now building in France a new gun of his own patent. This gun is intended for coast defense and will be of the following general dimensions, &c.:

Caliber, 34 centimeters (13.4 inches); weight, 37,000 kilograms (37 tons); weight of projectiles, 400 kilograms (880 pounds); weight of charge, 180 kilograms (396 pounds); muzzle velocity, 600 meters (1,968 f. s.).

It is claimed that this gun will have a range of 12 miles.

*Guns furnished for re-arming the navy.*—In 1879 it was decided by the French Government to rearm the navy with modern high-powered guns. The following under this decision have already been put in service: 3 guns of 42 centimeters (16.5 inches)—(four more also about ready); 21 guns of 34 centimeters (13.3 inches); 21 guns of 32 centimeters (12.6 inches); 9 guns of 27 centimeters (10.6 inches).

The following will be delivered during 1885: 4 guns of 42 centimeters (16.5 inches); 3 guns of 37 centimeters (14.5 inches); 7 guns of 34 centimeters (13.3 inches); 14 guns of 27 centimeters (10.2 inches).

In 1886 there will be delivered: 4 guns of 37 centimeters (14.5 inches); 3 guns of 34 centimeters (13.3 inches); 10 guns of 27 centimeters (10.2 inches).

## GERMANY.

In Germany the tendency is towards very long guns, slow-burning powder, and heavy projectiles. The following guns are now being experimented with or building:

| Diameter of bore. | | Length (calibers.) | Remarks. |
|---|---|---|---|
| In centimeters. | In inches. | | |
| 15 | 5.9 | 25 | |
| 15 | 5.9 | 30 | |
| 15 | 5.9 | 35 | |
| 21 | 8.2 | 30 | |
| 21 | 8.2 | 35 | |
| 24 | 9.4 | 35 | |
| 26 | 10.2 | 35 | |
| 28 | 11 | 35 | |
| 30.5 | 12 | 25 | |
| 30.5 | 12 | 35 | 37.7 tons. |
| 35.5 | 13.9 | 30 | 49.2 tons. |
| [1] 40 | 15.7 | 35 | 58.5 tons. |
| 45 | 17.7 | 25 | 120 tons. |

NOTE.—Deduct three calibers to obtain the length of bore.

[1] The 40-centimeter gun is intended for the coast defense of Italy.

All of these guns are intended for the navy or coast defense. The heavy steel shells have been adopted for all armor-piercing projectiles.

The Germans are working towards the use of but two brands of powder differing in density, the denser being for the larger calibers. In the last trials the powder adopted was the prismatic with large holes. This class was also tried in France and England with satisfactory results. The French factory of Sevran Livry has produced several samples of prismatic powder which compare very favorably with the German powders.

The weight of the projectile used in experiments with these guns often exceeded in weight four times that of the solid spherical shot of the same caliber, and some were as much as 3.3 calibers long.

Had French instead of German projectiles been used the muzzle velocities would have been as follows:

For guns of 25 calibers in length, 580 meters, or 1,902 f. s.

For guns of 30 calibers in length, 615 meters, or 2,017 f. s.

For guns of 35 calibers in length, 640 meters, or 2,099 f. s.

These velocities would have been obtained with pressures not above 2,400 kilograms per square centimeter (34,285 pounds per square inch), except in the gun of 45 centimeters, where the pressures would have reached 2,600 kilograms per square centimeter, or 37,143 pounds per square inch. The use, however, of the heavy projectiles of the Germans decreases the muzzle velocity and increases the pressures, so that in the late trials the pressures rose as high as 2,700 kilograms per square centimeter (38,571 pounds per square inch), while the velocities did not exceed 565 meters per second, or 1,853 f. s.

# TORPEDO BOATS.

## ENGLAND.

The Eastern war-cloud has given great impulse to the development of the English torpedo fleet, the following additions to it having been made since March:

| | |
|---|---|
| Purchased from Chili | 4 |
| Received from Thornycroft & Co | 2 |
| Ordered from Thornycroft & Co | 25 |
| Ordered from S. White | 20 |
| Ordered from Yarrow & Co | 4 |
| Total | 55 |

The two (Nos. 21 and 22) recently delivered by Thornycroft & Co. are large sea-going boats. Their principal dimensions are: Length, 113 feet; beam, 12 feet 6 inches; draught, 2 feet forward and 6 feet aft. These boats are fitted with three launching tubes; two in the bow are fixed, while the third, near the stern, can be trained from below the deck and fired from the pilot-house. During their three-hour speed trials in the Solent these boats maintained speeds of 19.73 and 19.97 knots, the engines developing upward of 700 H. P. At moderate speed these boats can steam, without recoaling, 1,100 miles. They carry one Nordenfeldt gun.

The boats recently ordered from Thornycroft are to be of larger and improved type. They are to be built of steel, with fourteen water-tight compartments, and will carry 20 tons of coal, which, at 10 knots speed, will enable them to steam 2,000 miles. Their principal dimensions are: Length, 125 feet; beam, 12 feet 8 inches; draught, 6 feet 2 inches aft; estimated speed, 19 to 20 knots.

These boats will be fitted with five torpedo-tubes; one on the bow, one on each side of the pilot-house, and two astern; all except the bow tube mounted on towers capable of being trained through a considerable arc. In addition to their torpedo armament they are to carry two Nordenfeldt guns.

The cost of each of these boats is to be £11,000. Their speed is not so great as that of other boats, but the advantages of the all-around fire of their torpedoes quite compensate for the loss of speed.

The new class known as torpedo hunters (or catchers) is well represented by the boat now building at Mr. White's yard at Cowes. This boat is constructed on Mr. White's turn-about principle, which gives great turning powers when going ahead or astern. A boat of 100 feet length built on this plan has a turning circle of 75 yards diameter when going ahead, and 115 yards when going astern, in comparison with the circle of 350 yards diameter for a boat of 84 feet length built on the ordinary plan.

The torpedo hunter building at Mr. White's is to be 150 feet in length, 220 tons displacement, and is to have a speed of 18 knots. It will be fitted with four torpedo-tubes, one firing directly ahead, one on each bow, and one astern.

## FRANCE.

### VOYAGE OF TORPEDO BOAT NO. 68 THROUGH THE RIVERS AND CANALS OF FRANCE.

An important feature in the general system of French home-defense is illustrated by the voyage of torpedo boat No. 68 from Havre to Toulon, through the canals and inland waters of France, in May last.

The strategic importance of this interior line of communication from the English Channel to the Mediterranean is most obvious, and the superiority of the French torpedo fleet over that of the English will be greatly increased by the facility with which boats may be transferred from one sea to the other.

Torpedo boat No. 68 was built by Normand & Co., of Havre; is 108 feet long, 10.8 feet beam, with 6.4 feet draught at 49 tons displacement, and has developed a speed of 21 knots. As the canals do not admit of the passage of boats of this draught, it was necessary to lift the boat by means of caissons and cork belts, specially fitted before the voyage, in order to reduce the draught to 4.1 feet.

### NIGHT ATTACK OF TORPEDO BOATS.

During the past spring an interesting experiment was made by the French squadron of evolutions, consisting of four armored vessels and three torpedo boats under the command of Vice-Admiral Duperré, to ascertain the practicability of a successful attack upon a fleet by torpedo boats. Signal was made during the early evening to prepare to receive such an attack, and three torpedo boats left the squadron to return under the cover of night. Warning was given that the attack was to be expected after midnight and before 3 o'clock a. m. The night was dark, but the electric light searched the sea and additional lookouts kept vigilant watch. It was decided that any vessel which allowed a torpedo boat to approach within 50 meters without being recognized and exposed to the fire of rifles and machine-guns was to be considered destroyed.

Suddenly, and within the specified time, three red lanterns were almost simultaneously displayed within 40 meters of some of the vessels of the squadron, which indicated that three torpedo boats had successfully passed within the dangerous zone and had penetrated it to a distance which secured the destruction of most of the squadron.

These torpedo boats had accompanied the French squadron during their entire cruise, and upon one occasion were able to keep the sea when some of the armored vessels (coast defense ships) were obliged to seek a harbor, and it is said that their speed was from 14 to 16 knots while that of the ships was reduced from 14 to 7 knots.

## GERMANY.

The German Government in developing its coast defenses has placed great reliance upon torpedoes and torpedo boats, and has made a departure from the usual custom by placing all coast defenses (fortifications included) under the direction and control of the navy. The fleet of torpedo boats is to be increased to 150, and the plans and arrangements for closing the principal harbors are so complete and precise that but a few hours' notice is necessary to place all the mines in position and prepare the torpedo flotilla for service.

In the last type of torpedo boat received from Yarrow the German admiralty has found a very desirable addition to its fleet. This boat is 120 feet long, 13.2 feet beam, 5½ feet draught, and 65 tons displacement. It carries 25 tons of coal, and has steamed at a speed of 19 knots for three hours. The boat is exceedingly steady in a seaway, and is so constructed and arranged that it may steam fifty miles should the engine-room compartment be filled with water. It is fitted with two torpedo-tubes.

The latest German torpedo boats are 35.9 meters (109 feet 5 inches) long, 3.81 meters (11 feet 7 inches) wide, and displace 75 tons at a draught of water 1.88 meters (6 feet 2 inches). They launch 35.5-centimeter (14-inch) torpedoes from two tubes, are masted, and can travel with sail-power only. They carry a large quantity of coal, 22 tons, which enables them to travel 3,000 miles at 11 knots. The coal is disposed so as to afford great protection to the boilers and machinery. There are comfortable quarters for officers and crew. These boats are fitted with a cooking-stove, a Normandy condenser, two Hotchkiss guns, and an electric search-light. Their total cost, complete in every respect, is only $50,000. The German Government is getting some of these boats from Thorncroft, in England, and others at Stettin. The German-built boats have given better results than the English.

In March, 1885, the German Government had two torpedo boats building by Thorncroft and one by Yarrow, while the Weser Company was building six, the Vulcan Company ten, and the Schichau Company six; making a total of twenty-two building in Germany.

## AUSTRIA.

Yarrow & Co. are building two torpedo boats for Austria which will have the highest speed yet attained.

Their dimensions are: Length, 135 feet; beam, 13.75 feet. They are to develop 1,100 1,200 H. P., and are to have a speed of 24 knots when light, and 22 knots when loaded ready for service.

## TURKEY.

The Turkish Government has ordered six torpedo boats from the *Societé des Forges et Chantiers de la Méditerrancé.*

Their dimensions are: Length, 101.7 feet; beam, 11.7 feet; draught, 5.7 feet; displacement, 42 tons. They are to be fitted with two torpedo tubes in the bow, and are to carry a spar torpedo as well.

Upon its trial (in April) one of these boats while at her load displacement, carrying twenty-four persons, made 20.3 knots over the measured mile.

## JAPAN.

The Japanese Government has made a contract with Messrs. Yarrow & Co., of Poplar, for the construction of a sea-going torpedo boat of exceptionally large dimensions and novel design. It will be armored with steel plates 1 inch thick throughout the central portion of the vessel, inclosing the machinery compartment, so that the vital parts of the boat may be protected from machine-gun fire at a range suitable for discharging the Whitehead.

The dimensions of this new boat are: Length, 166 feet; beam, 19½ feet; and it will have a speed of 19 knots. It will carry several machine-guns in addition to the four discharging tubes. Exceptional maneuvering powers are expected from the system of propulsion by twin screws.

# TORPEDOES.

## UNITED STATES.

### THE HOWELL TORPEDO.

In the report of the Secretary of the Navy for 1884, volume 1, pages 528–531 and 543–547, may be found a description of this torpedo, with an account of its trials in June, 1884, before a board of naval officers.

A further series of preliminary trials of a newly-constructed torpedo of this type was made at the Washington navy-yard, June 26–27, 1885. The torpedo used was 8 feet 10½ inches long, 14 inches maximum diameter, and weighed 296 pounds with 50 pounds of lead to represent the charge.

It attained a speed of 14¼ knots for a distance of 640 feet with but ninety turns of the wheel, and towing a small wooden buoy used to recover the torpedo.

No automatic torpedo of this size has reached such a speed; and the charge, 70 pounds, is greater than that carried by any but the largest Whiteheads.

The torpedo broke water twice on one occasion and four times on another. This may be accounted for to a large degree by the towing effect of the buoy. The steam pressure available for conveying motion to the wheel on this trial was but 40 pounds, while with steam at higher pressure 168 revolutions have been obtained. (The strength of the wheel will permit of more than 250 revolutions.)

The trial made July 1 with the same torpedo gave very satisfactory results. The accelerator operated for 1 minute 20 seconds, giving about 115 turns. The speed was not noted, but the torpedo did not come to the surface during its run, in spite of the towing buoy, and its range on this occasion was about 450 yards.

It may be fairly expected that a considerable addition of speed and weight of charge will be obtained from the future torpedoes of this type, which is now regarded with much interest and favor as a weapon powerful for offense and defense.

The cost of the Howell torpedo is at present about $300. When made in large numbers a considerable reduction of price may naturally be expected.

### TORPEDO IMPROVEMENTS, ETC., ABROAD.

Many patents have been taken out and many experiments made abroad during the past year with torpedoes of all kinds and classes, but the Whitehead is still the most reliable and generally used. Improvements have of late been made in its construction that have increased its destructive power and accuracy much beyond the models of former years. Phosphor-bronze is superseding steel in the construction of new Whitehead torpedoes, as it admits of their being accurately adjusted by trial runs, and stored away without being taken apart to clean, as was required with the old steel ones. Those built in Germany are all of this metal, and are of fine workmanship and extremely accurate. Out of sixty runs made at Kiel a short time since, the mean error in direction at 400 meters was only 2.4 meters, and the depth was within a small decimal of what the torpedo was intended to maintain. The latest improvement in this weapon has been the increase of the charge to 70 pounds of gun-cotton and the increase of the speed to 25 knots. This last torpedo is 14 feet long and maintains its speed of 25 knots for 433 yards. One of the uses the German Government proposes to make of this torpedo is to sink several in a caisson in the middle of the channel and pointing in a known direction, so arranged that they may be fired from shore by electricity. By this means the range is much increased.

The various adjustments have of late been so simplified that the distance at which success is almost certain has risen from 200 meters to 500 meters, while inside of 300 meters failure is almost impossible, and the greatest deviation at 500 meters is not over 6 or 8 meters. At the same time its motive power has been so increased that it is now sufficient for a distance of four knots, which is almost double its former run.

The failure of the machinery that once was so common is now the exception.

Lastly, with these many improvements the price has fallen from £375 to £300.

### BRENNAN TORPEDO.

The London Times states:

"For a year or so past experiments have been carried out to test the powers claimed for a new torpedo invented by a young Australian, Mr. Brennan, and offered by him to the British Government. The Admiralty allowed the inventor to use a casemate on the upper tier of Garrison Point Fort, Sheerness, and a torpedo factory was erected outside the fort with a tramway running down to the sea-beach. The trials have taken place, and the mechanism has been so far perfected as to admit of an official inspection. This has proved so satisfactory that the Admiralty have already agreed to adopt the torpedo as a part of the national armament. The new torpedo is impelled by a steam-engine within the fort, which acts upon it by winding in very rapidly two wires coiled around reels within the torpedo. As the wires are independent of each other and actuate different propellers the torpedo can be steered from the engine with great accuracy. It is even practicable to stop the torpedo in full flight and send it on again, but this tries severely the endurance of the wires, which are very small.

"Jets of light are produced by some chemical agency, and are simply to indicate the position of the torpedo at night; being screened in front, they are visible only to observers in the rear."

While the Times is authority for the statement that this torpedo has been accepted by the English Government, many professional authorities do not place high value upon the invention.

### TORPEDO EXPERIMENT IN SPEZIA, 1885.

A caisson with a triple hull of steel, representing a section of one of the newly-designed ships (probably the Umberto and Sicilia), was moored in the Bay of Spezia. This caisson was covered with an armored deck and ballasted to float at the proper depth to represent properly the vital parts of the ship.

A Whitehead torpedo was fired at this target. The explosion of 27 kilograms (60 pounds) of gun-cotton broke through the first and second bottoms, but the interior hull remained intact, and the stability was not materially impaired.

A second torpedo was fired at the caisson, but on this occasion the explosion took place against a compartment filled with coal. This time the outer bottom only was broken, and it is said that the second and third system plates showed no signs of rupture.

From these experiments the Italian commission concludes that triple thicknesses of plates, properly fastened and supported, will protect the interior of a vessel from the explosion of the Whitehead torpedo. In consequence, orders have been given to begin the construction of the newly-projected ships.

## THE NORDENFELT SUBMARINE BOAT.

The boat is of the so-called "cigar shape." Its length is 64 feet, with a diameter of 9 feet at the center; but a small conning-tower on top and the sponsons on the sides increase the extreme dimensions to length 64 feet, beam 12 feet, and depth 11 feet.

It is built of the best Swedish mild charcoal steel. The plates in the center are five-eighths of an inch thick, but decrease in thickness to three-eighths of an inch at the extremities. The hull will withstand a pressure of 100 feet of water. The conning-tower, 12 inches high, is fitted with a cover which can be readily swung upon a pivot to give easy ingress or egress to the three men who form the crew. This cover has a glass cupola, protected by a shield, so the officer in charge standing in the tower may have an all-around lookout.

Sponsons on either side of the boat form wells for the protection of two propellers so placed as to exert their effort in a vertical direction. The boat, which is always kept horizontal and always buoyant, is submerged by means of these propellers to any desired depth, or is permitted to rise to the surface. This is one of the distinguishing features of this invention. Since the boat is always buoyant and submerged by the mechanical power of the propellers working in a vertical direction, it will not sink should any part of the mechanism become out of order, but will of its inherent buoyancy rise to the surface.

The four-blade propeller, at the stern, is 5 feet in diameter, with a pitch of 7 feet 6 inches. The rudder for lateral steering is placed abaft this propeller.

The horizontal position before referred to constitutes another distinguishing feature, and is maintained by a system of weights acting on a pair of balanced horizontal rudders which constitute the "longitudinal stability apparatus." These rudders, placed in the bow of the boat on either side, are secured to one axle. They are always kept in the horizontal position by a weight attached to an arm acting in a plane at right angles to the rudder axle. This weight will always maintain its arm vertical, and since this is in a plane at right angles to the rudders they will always be held horizontal. The same effect may be produced by the weight acting upon the valves of a hydraulic engine controlling the rudders.

When the length of the boat is considered, the necessity of the "longitudinal stability apparatus" to prevent the ends of the boat striking the bottom is obvious, and as the apparatus is said to be perfectly effective, the boat can operate in shallow water.

The machinery is actuated by steam which is derived while the boat is on the surface of the water, from an ordinary marine boiler in which any fuel may be used; but as the draught is forced, anthracite coal is preferred as making least smoke and sufficient steam.

When the boat is submerged steam is supplied by means of the heat stored in water while the boat was on the surface. This hot water is carried in two tanks, as well as in the boiler, and is 8 tons in weight. The propulsive force is obtained by a compound surface-condensing 2-cylinder engine. The cylinders are of 12 and 25 inches diameter with a stroke of 10 inches. There are in addition two small engines of 4 inches diameter by 6 inches stroke, which are used to drive the blower when on the surface and the vertical side propellers when under water.

The boat is fitted with an apparatus for cooling the air, indicating the life-sustaining properties of the air, indicating the depth at which the boat is working, and an automatic arrangement to stop the vertical propellers when the boat has arrived at a given depth and to start them again as it begins to rise. These, together with a compass, thermometer, and barometer, give all necessary information to the commander.

Powerful pumps are fitted in case leaking should occur, besides which the boat may be much lightened by blowing out the 8 tons of hot water carried.

No compressed air nor chemical method of purifying the air is needed, as the boat has sufficient air space to render such arrangement unnecessary.

The crew can quickly get out of the boat by swinging off the conning-tower lid, which can be done at any depth at which men can withstand the pressure of the water.

The following are some of the actual experiences obtained from the first boat:

Four men have been shut up in the boat for six hours without any connection with the outside atmosphere and suffered no inconvenience.

The longest period that the boat has remained under water with cupola submerged, with crew on board, without coming to the surface, is one hour.

The greatest depth at which the boat has been operated is 16 feet below the surface.

It has always been practicable to keep the boat within 1 foot of the desired depth.

The greatest distance the boat has traveled when completely closed and driven only by the heat stored in the hot water is 16 miles. The speed maintained on this occasion was 3 miles per hour, the initial pressure in the hot-water tanks being 150 pounds to the square inch, so that it is claimed that the boat can be relied upon to make 12 miles under water. The greatest speed recorded is somewhat over 8 knots on the surface.

The greatest distance made as an ordinary surface steamer, without recoaling, is 150 miles. The boat has made the passage from Stockholm to Gottenburg, by the inner route, stopping at different ports for coal. On this passage it experienced rough weather and proved itself seaworthy. (The telescopic smoke-pipe was then raised as in an ordinary boat.)

The present boat is constructed with a view of being armed with one Nordenfelt controllable towing torpedo, and one Whitehead torpedo to be fired from a tube in the bow. With an increase of size the boat could travel greater distances, have greater speed, and could carry three Whitehead torpedoes.

The peculiar advantages of this invention are those common to all submarine boats—secrecy of movement, whether for attack or defense, or for avoiding an enemy's lines or lookouts.

Plate 1.

# Plan of Settlement, Foochow.

DRAWN BY H. Morrell. Lieut. U.S.N.

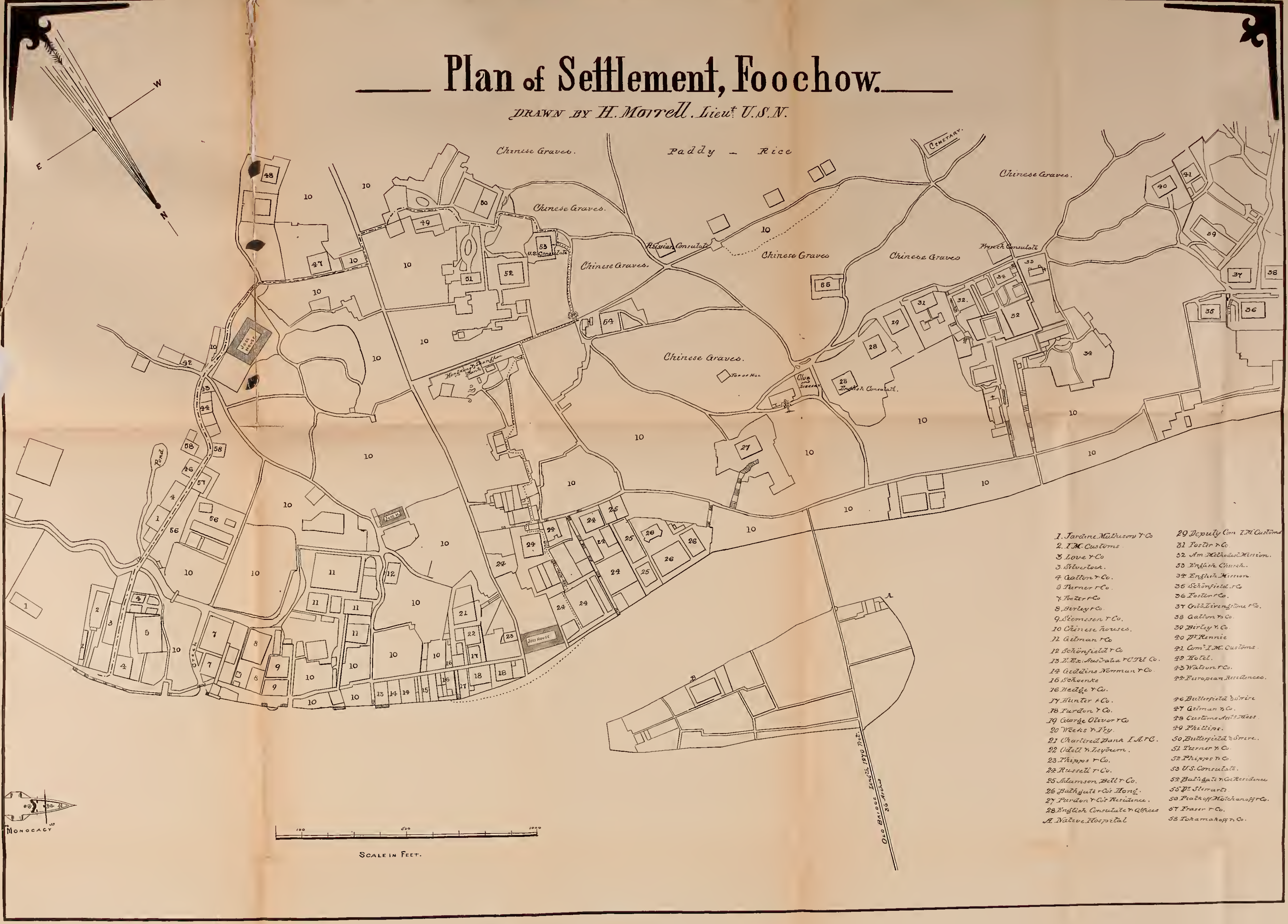


PLATE II.

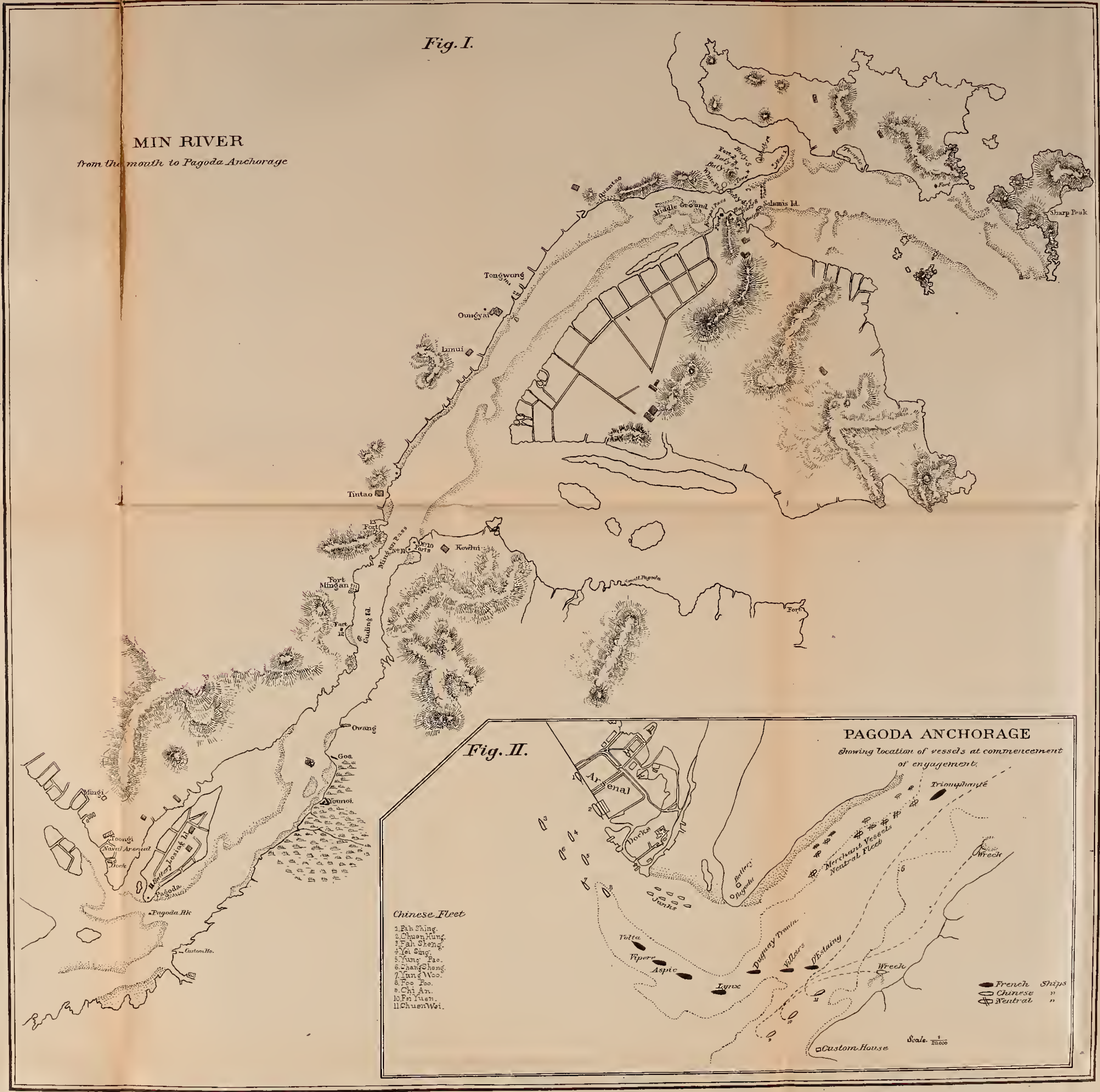


Fig. I.

## MIN RIVER

*from the mouth to Pagoda Anchorage*

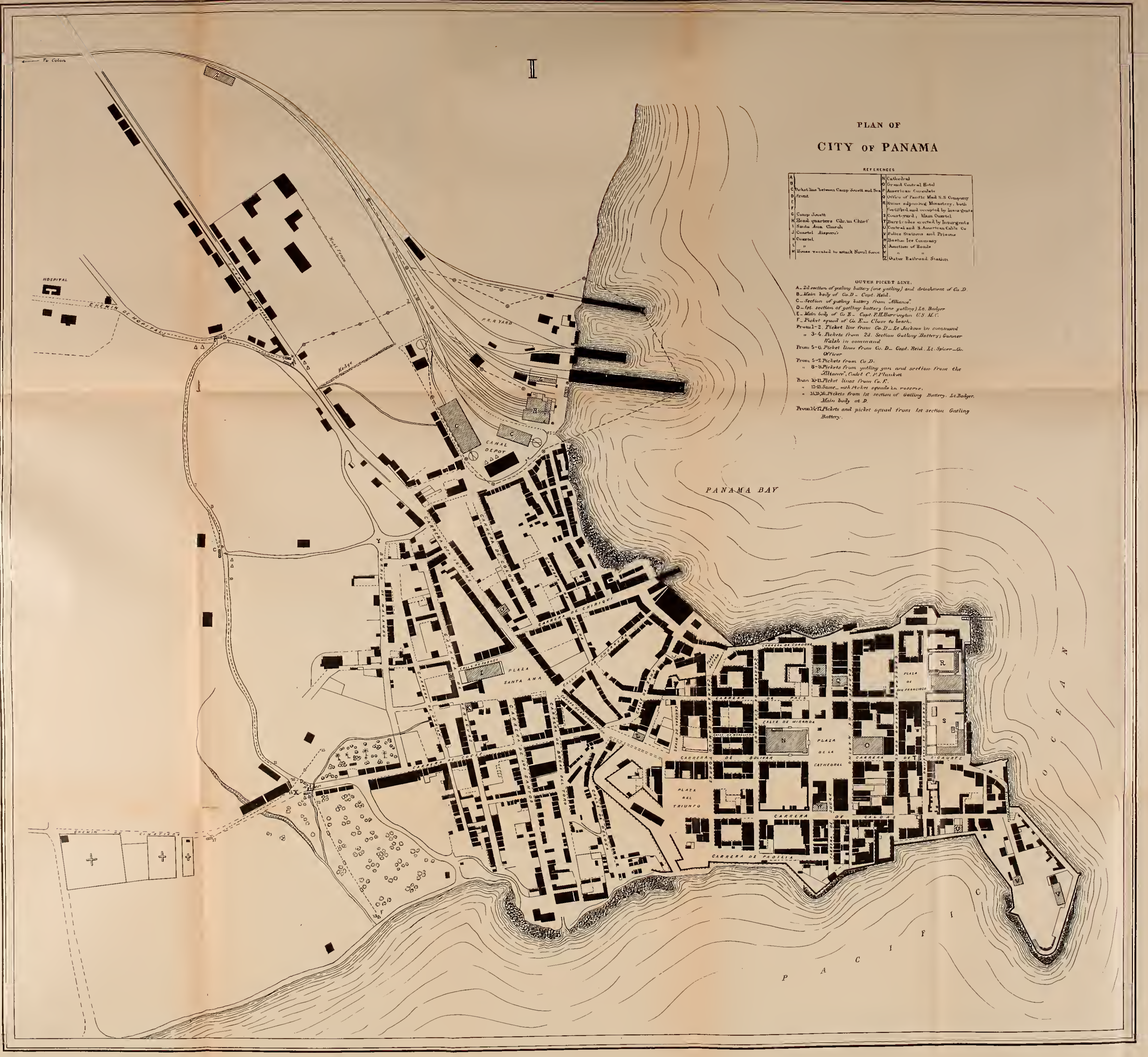
Fig. II.

## PAGODA ANCHORAGE

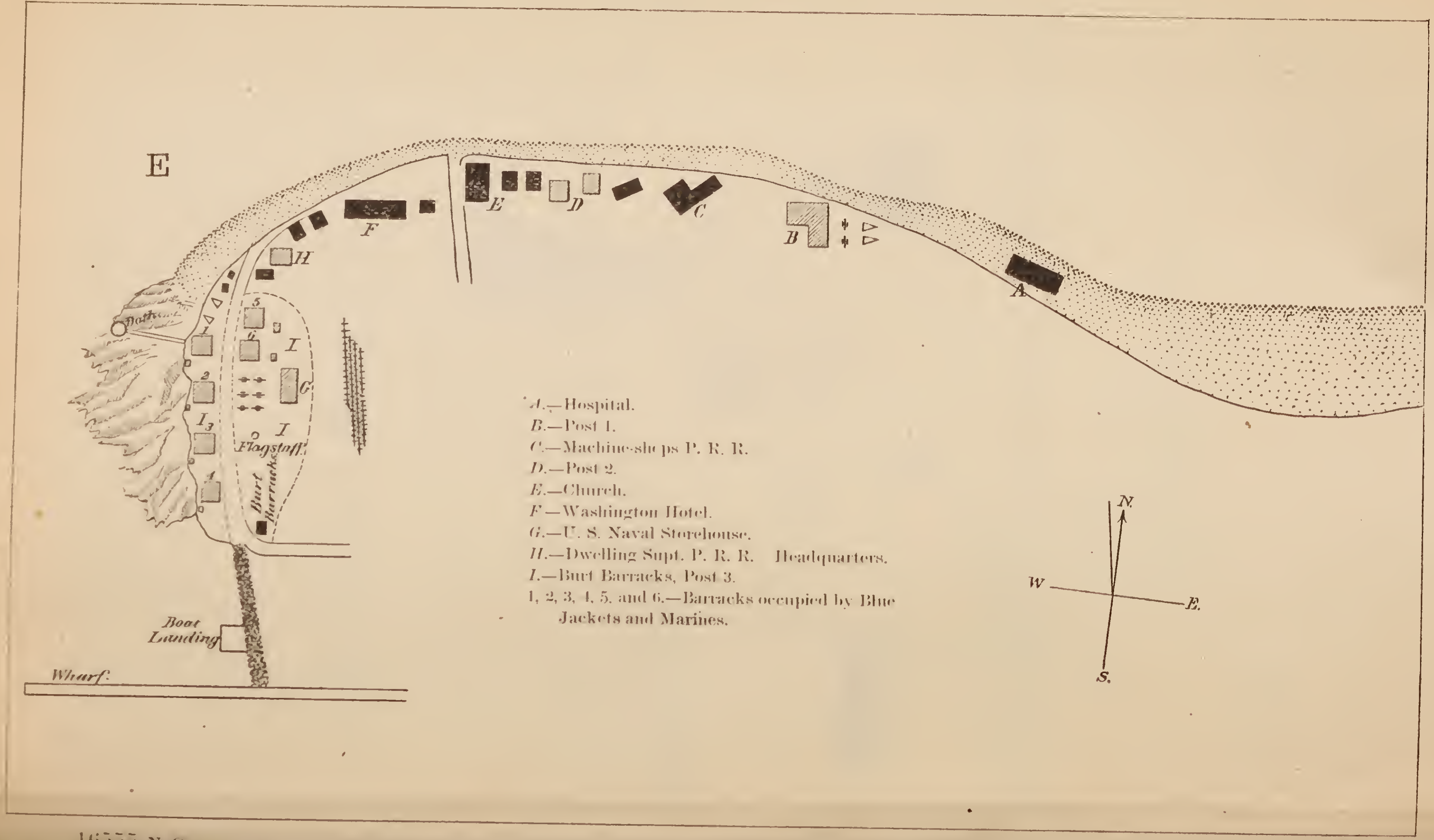
*Showing location of vessels at commencement of engagement.*

*Chinese Fleet*

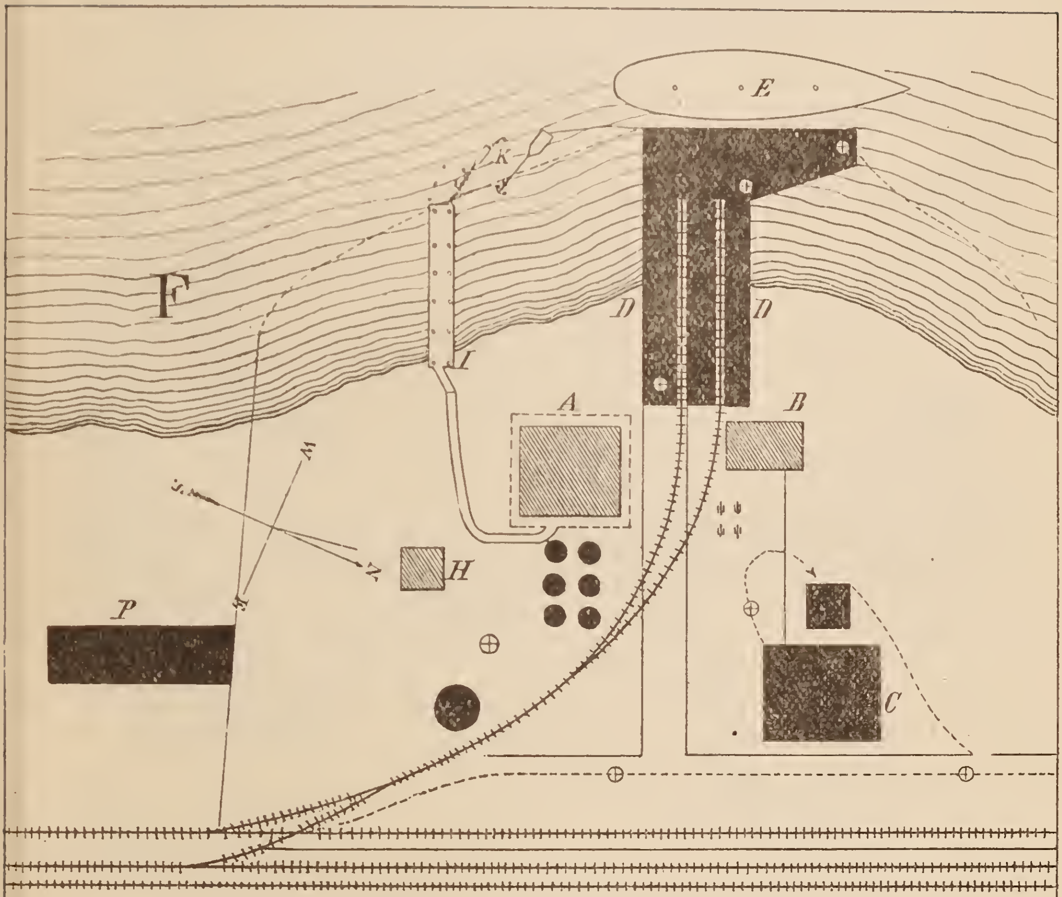
1. Fah Shing.
2. Chuen Hung.
3. Fah Sheng.
4. Yei Sing.
5. Yung Pao.
6. Chang Sheng.
7. Yung Woo.
8. Foo Poo.
9. Chi An.
10. Fei Yuen.
11. Chuen Wei.


I
PLAN OF
CITY OF PANAMA
REFERENCES
A
B
C Picket line between Camp Jouett and Sea front
D
E
F
G Camp Jouett
H Head-quarters Cdr. in Chief
I Santa Ana Church
J Cuartel Aizpuru's
K Cuartel
L "
M House vacated to attack Naval force
N Cathedral
O Grand Central Hotel
P American Consulate
Q Office of Pacific Mail S.S Company
R Ruins adjoining Monastery, both fortified and occupied by Insurgents
S Court-yard; Main Cuartel
T Barricades erected by Insurgents
U Central and S. American Cable Co
V Police Stations and Prisons
W Boston Ice Company
X Junction of Roads
Y " "
Z Outer Railroad Station
OUTER PICKET LINE.
A_2d section of gatling battery (one gatling) and detachment of Co. D.
B_Main body of Co. D_ Capt. Reid.
C_Section of gatling battery from "Alliance".
D_1st. section of gatling battery (one gatling) Lt. Badger
E_Main body of Co E_ Capt. F.H. Harrington U.S. M.C.
F_Picket squad of Co. E._ Close to beach.
From 1-2. Picket line from Co. D_Lt Jackson in command
" 3-4. Pickets from 2d. Section Gatling Battery; Gunner Walsh in command
From 5-6. Picket lines from Co. D_ Capt. Reid. Lt. Spicer_Co. Officer
From 5-7. Pickets from Co D.
" 8-9. Pickets from gatling gun and section from the "Alliance", Cadet C. P. Plunkett
From 10-11. Picket lines from Co. E.
" 12-13. Same_ with Picket squads in reserve.
" 14,15,16. Pickets from 1st section of Gatling Battery. Lt. Badger. Main body at D.
From 14-17. Pickets and picket squad from 1st section Gatling Battery.
To Colon
HOSPITAL
CHEMIN DE HOSPITAL
P.R.R. YARD
CANAL DEPOT
PANAMA BAY
PLAZA SANTA ANA
CARRERA DE COLON
CARRERA DE CHIRIQUI
CARRERA DE CORDOVA
CARRERA DE PAEZ
CALLE DE MIRANDA
PLAZA DE LA CATHEDRAL
CARRERA DE BOLIVAR
CARRERA DE RICAURTE
CARRERA DE CALDAS
CARRERA DE PADILLA
PLAZA DEL TRIUNFO
PLAZA DE SAN FRANCISCO
CHEMIN DE CIMETIERE
P A C I F I C
O C E A N

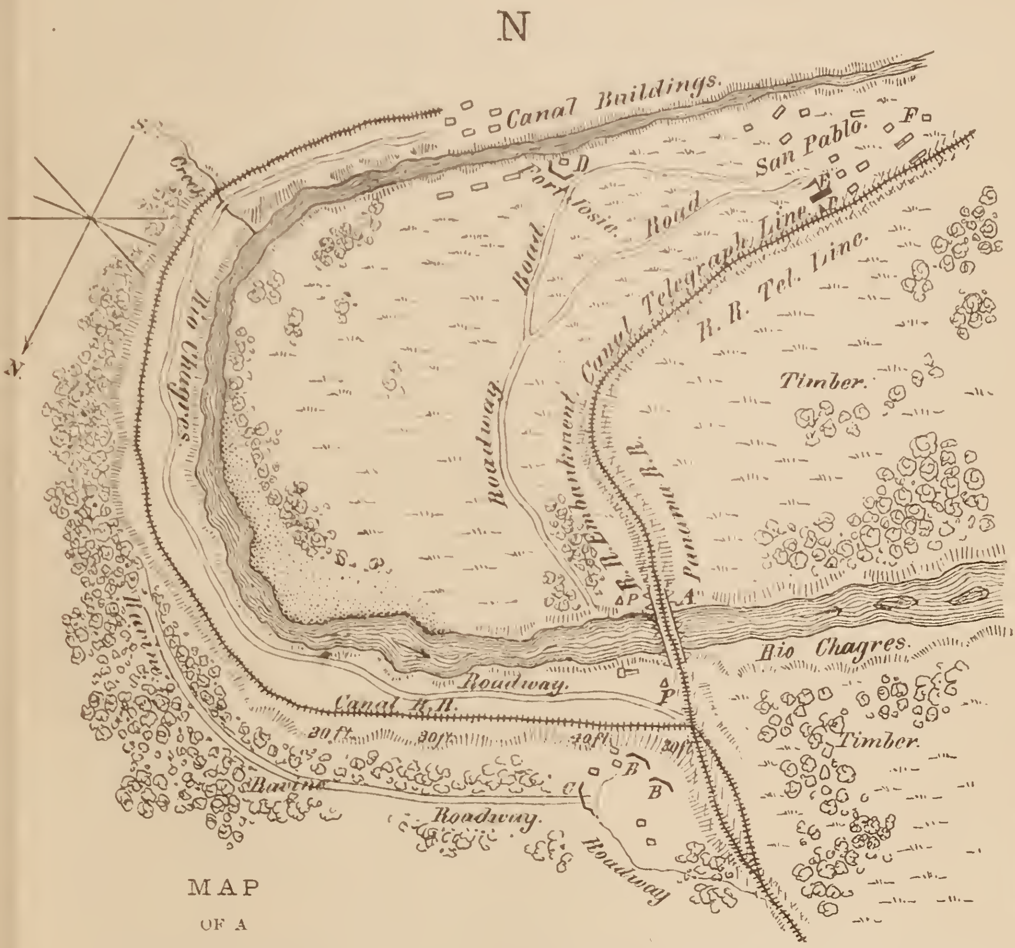
# PLAN SHOWING HEADQUARTERS' AND GARRISONS Nos. 1, 2, & 3.—COLON.


E
Bathing
1
2
I3
4
5
6
I
I
G
H
F
E
D
C
B
A
Flagstaff
Burt Barracks
Boat Landing
Wharf.
A.—Hospital.
B.—Post 1.
C.—Machine-shops P. R. R.
D.—Post 2.
E.—Church.
F—Washington Hotel.
G.—U. S. Naval Storehouse.
H.—Dwelling Supt. P. R. R. Headquarters.
I.—Burt Barracks, Post 3.
1, 2, 3, 4, 5, and 6.—Barracks occupied by Blue Jackets and Marines.
N.
W
E.
S.

## PLAN OF POST No. 4, PACIFIC MAIL CO.'S PROPERTY.



*A.*—Barracks.
*B.*—Barracks.
*C.*—P. M. S. S. Co.'s office.
*D.*—P. M. S. S. Co.'s wharf.
*E.*—P. M. S. S. Co.'s steamer.
*H.*—Kitchen.
*I.*—Wharf rebuilt by carpenters of Tennessee.
*K.*—Boats belonging to Expedition.
*P.*—Canal Co.'s shed.



MAP

OF A

RECONNOISSANCE

MADE NEAR

SAN PABLO,

BY

Lt. H. K. GILMAN, U. S. M. C.,

*April 25, 1885.*

*A.*—Pont de Barbacoas. Iron: 6 spans. Total length, 617 feet. Width, 17 feet. Height above river, 34 feet.

*B, B.*—Breastworks, 60 feet above bridge. Distant 50 yards.

*C.*—Rifle-pit to protect rear.

*D.*—Breastwork. Distant 300 yards from bridge. Fort Josie.

*E.*—Military Garrison. San Pablo.

*F.*—Telegraph office.

*P, P. P.*—Guard tents.

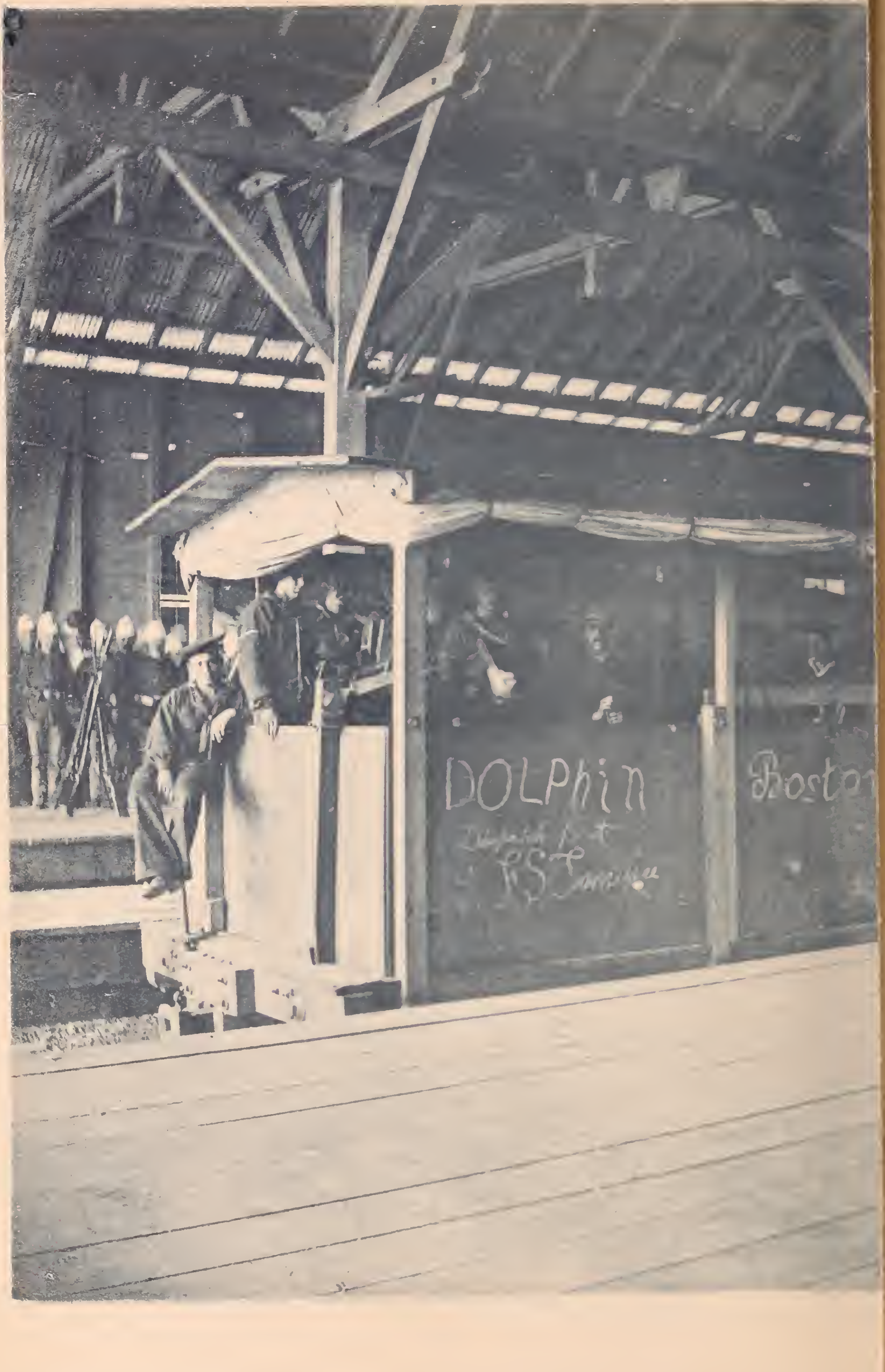
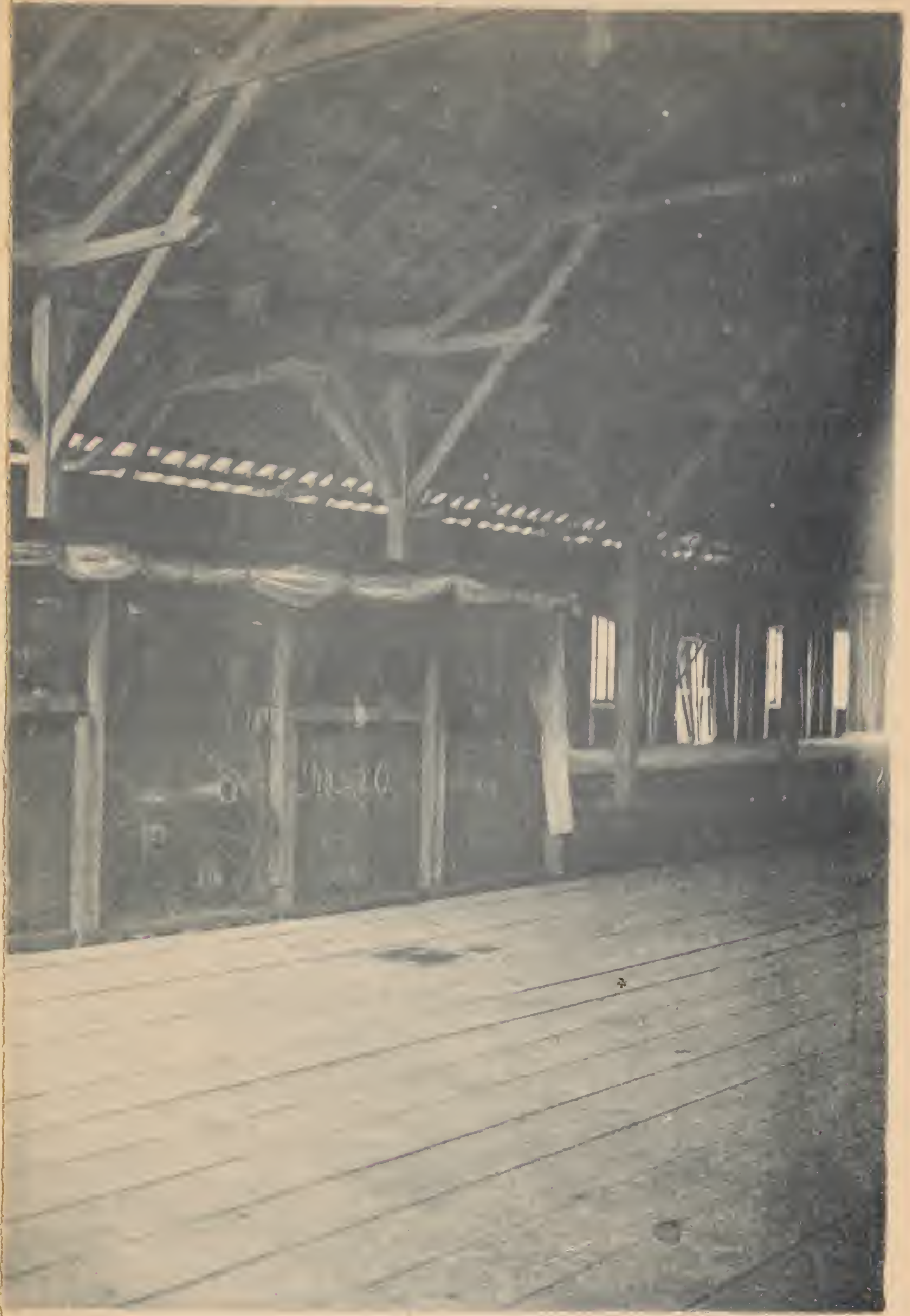


PLATE 5. VIEW OF ARMED CAR IN

[illegible]



IGHT SHED AT PANAMA, APRIL 13, 1885.

*FROM PHOTO. BY LIEUT. S. W. VERY, U. S. N.*

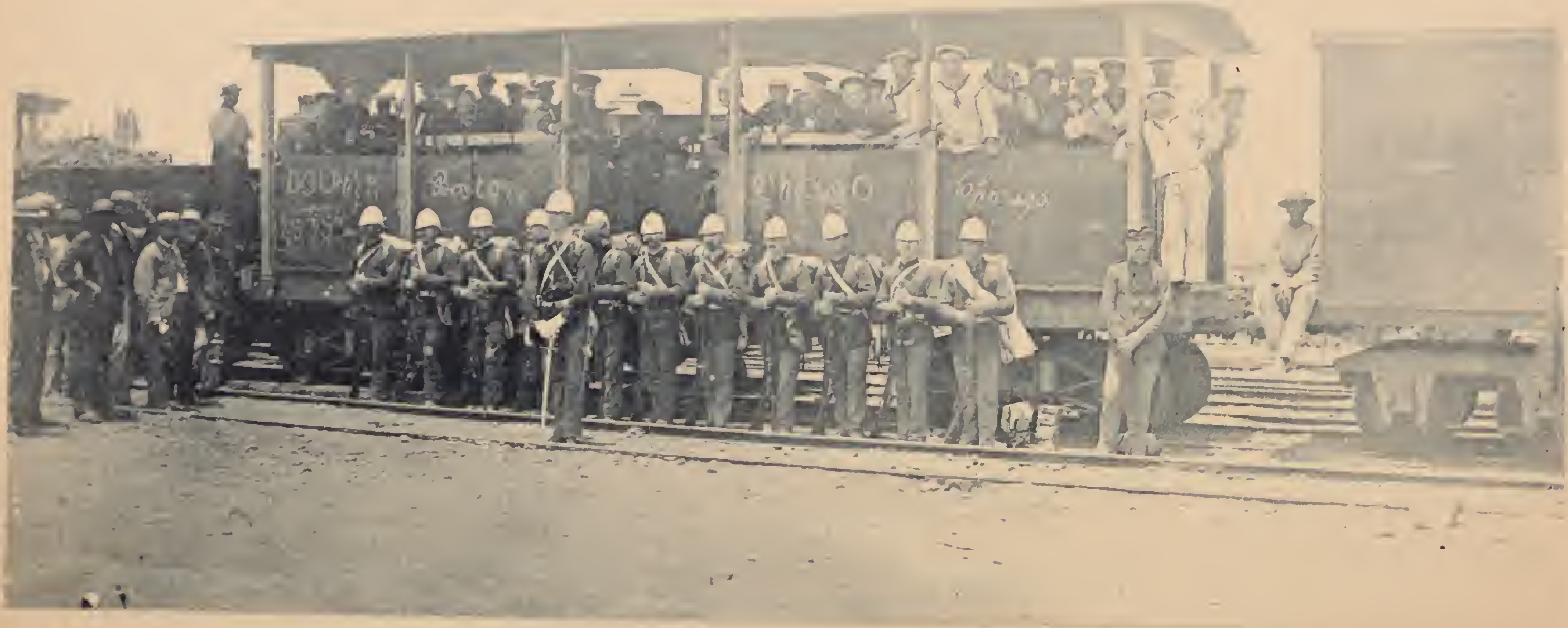


PLATE I. ARMED CAR AND MARINE TRAIN-GUARD.

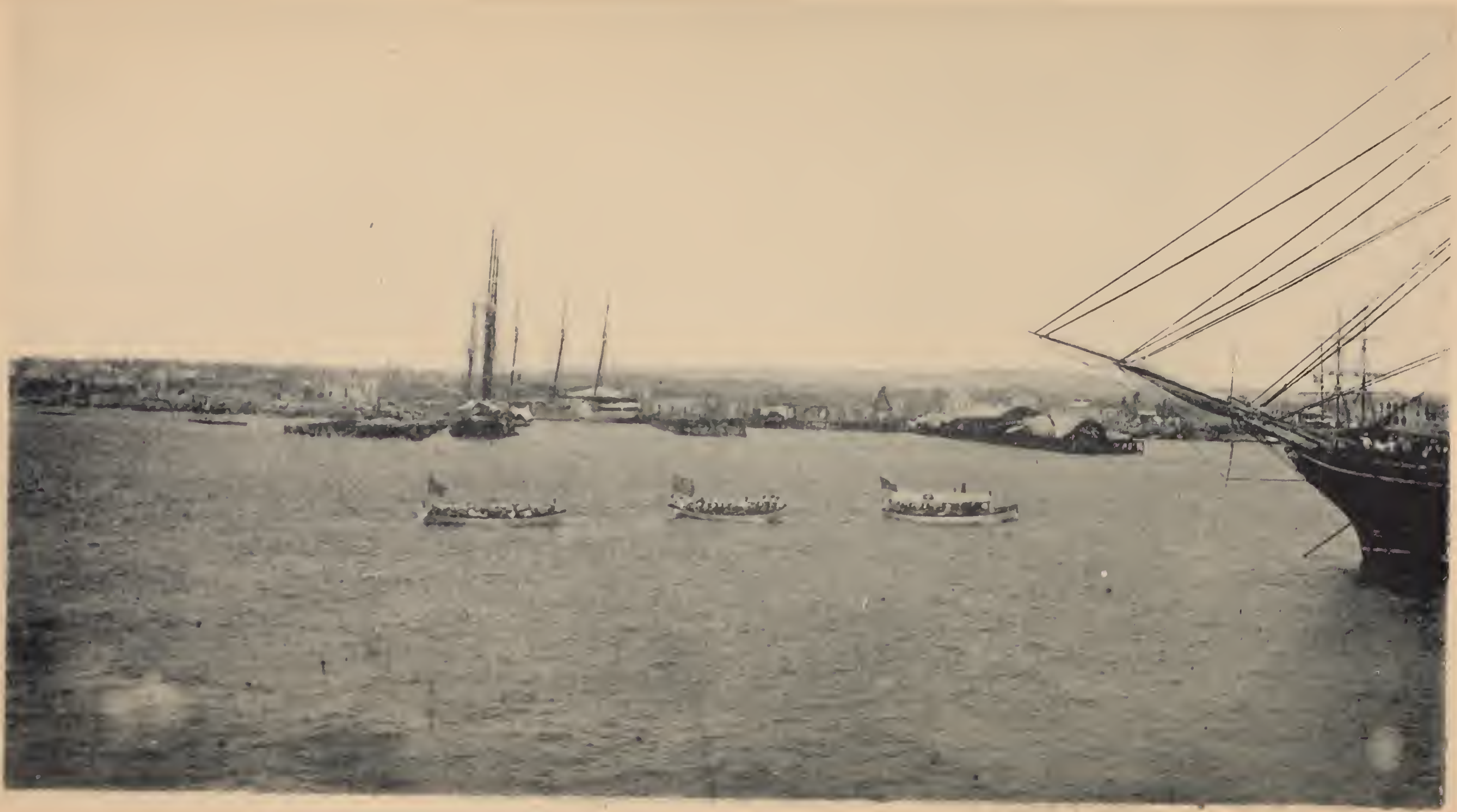
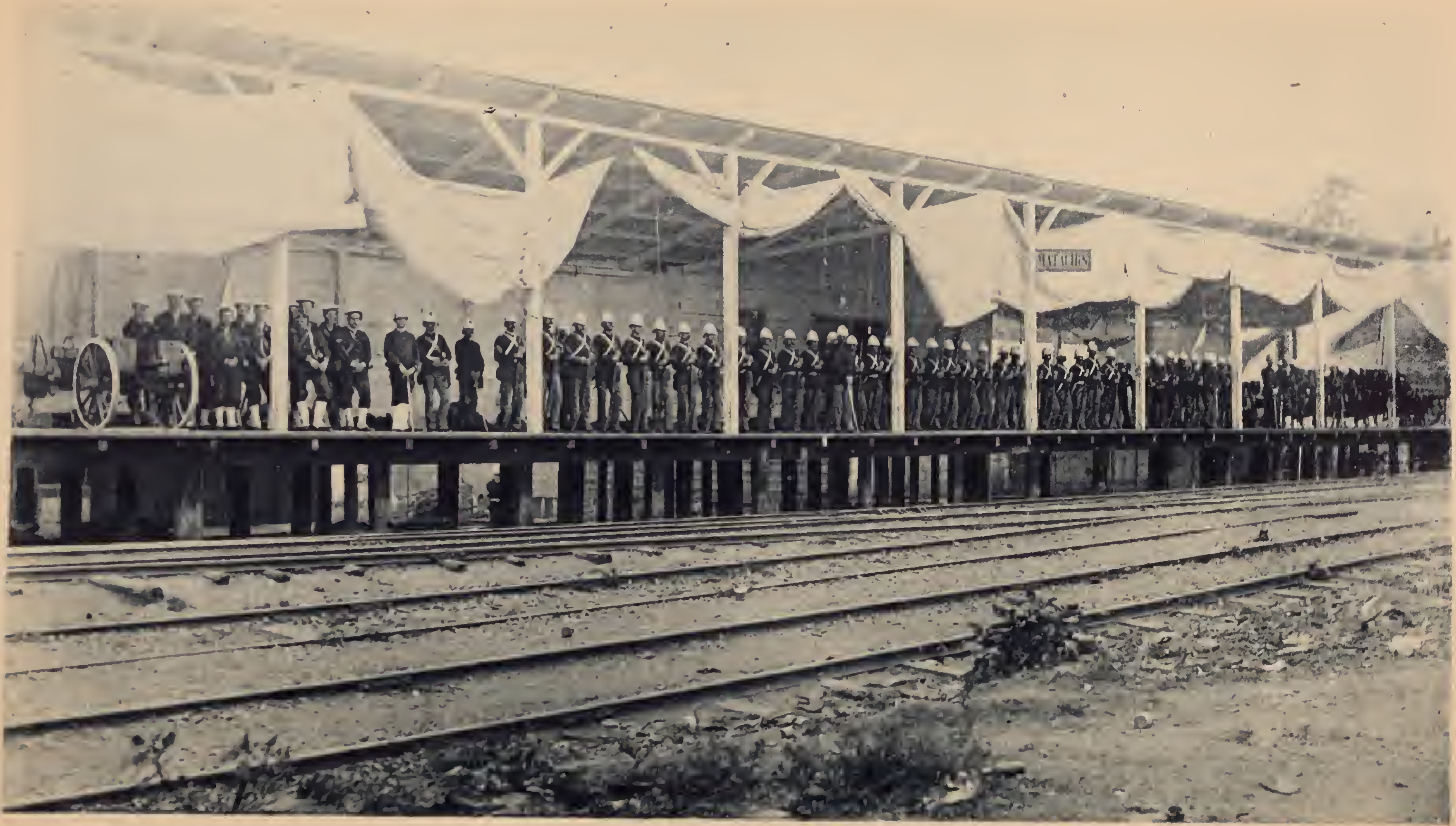


PLATE [illegible]

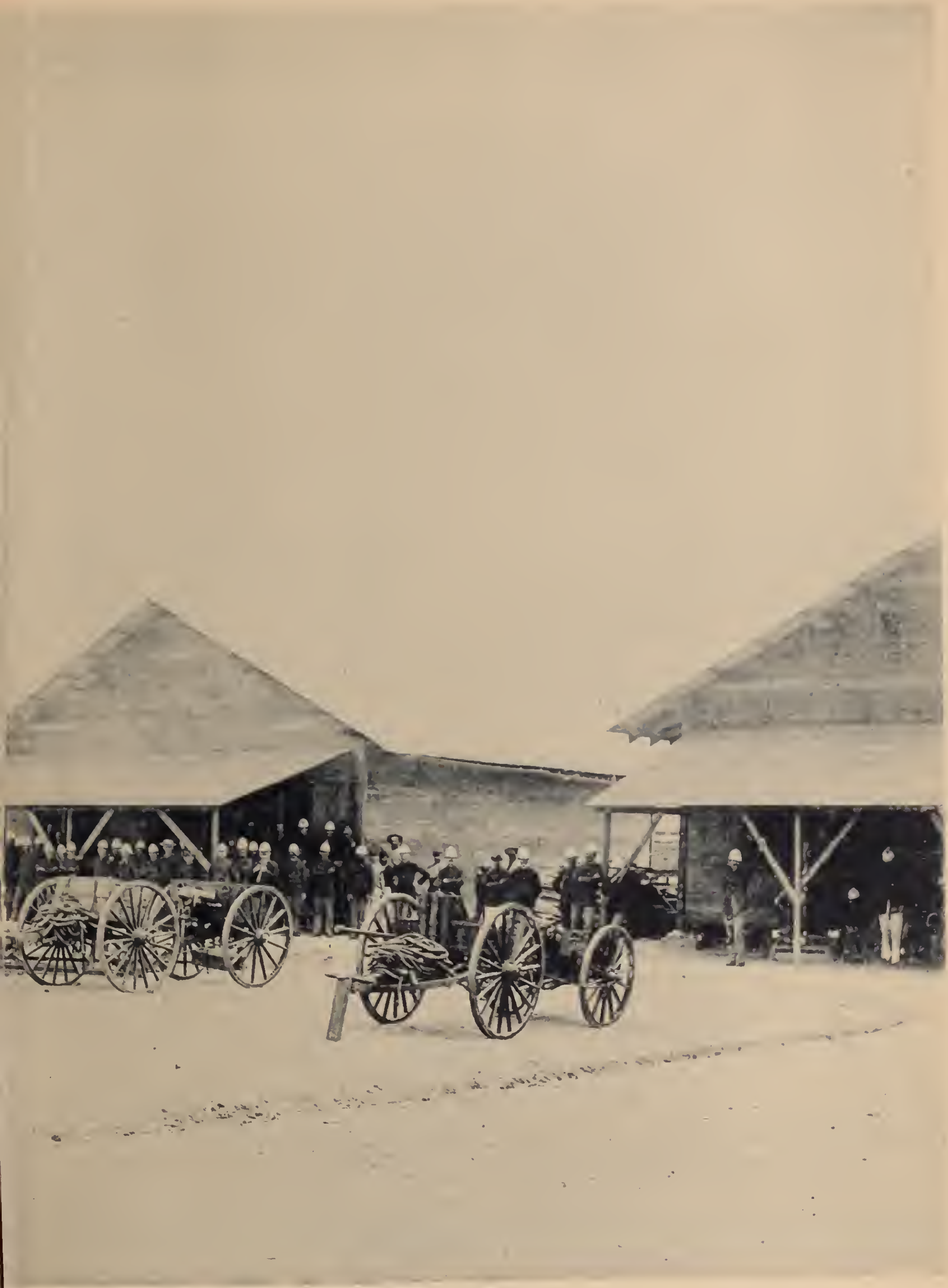
[illegible]



[illegible] AT MATACHIN [illegible]

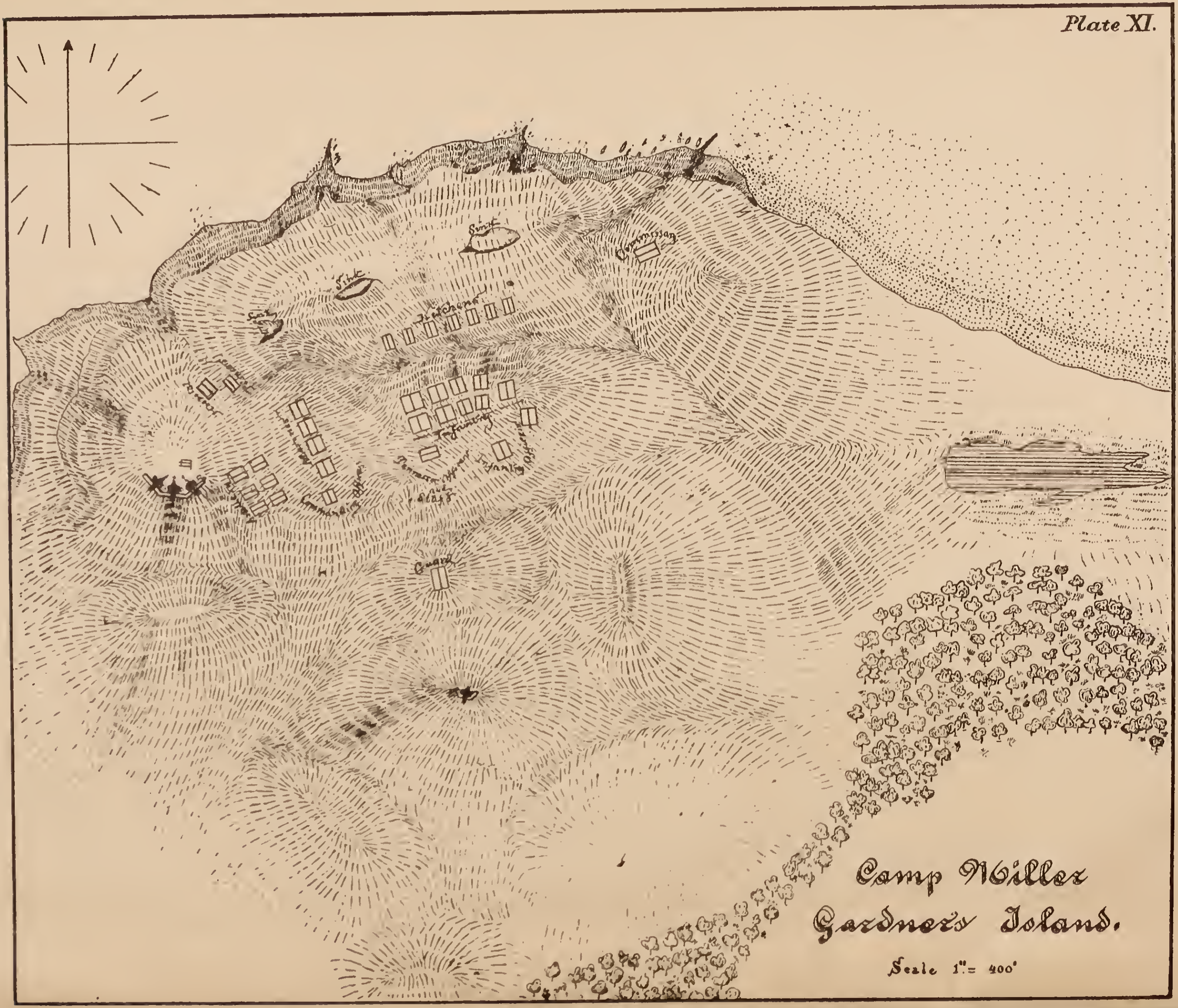
PLATE II. VIEW OF QUARTERS [illegible] AND

[illegible]



T OF THIRD GARRISON AT ASPINWALL

[illegible]



Camp Miller
Gardner's Island.

Scale 1" = 400'

6